



# Is SB 743 an Evolutionary Change to Transportation Impact Analysis?

*“All truth passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident.”*

- Arthur Schopenhauer, German Philosopher

*“All CEQA changes pass through three stages. First, they are ridiculed. Second, they are legally opposed. Third, they are accepted after being validated by the courts.”*

- Ronald T. Milam



SB 743

AB 417

AB 2245

SB 226

AB 1358

SB 375

SB 97

AB 32



# Regulatory Evolution

STATE OF CALIFORNIA

# General Plan Guidelines

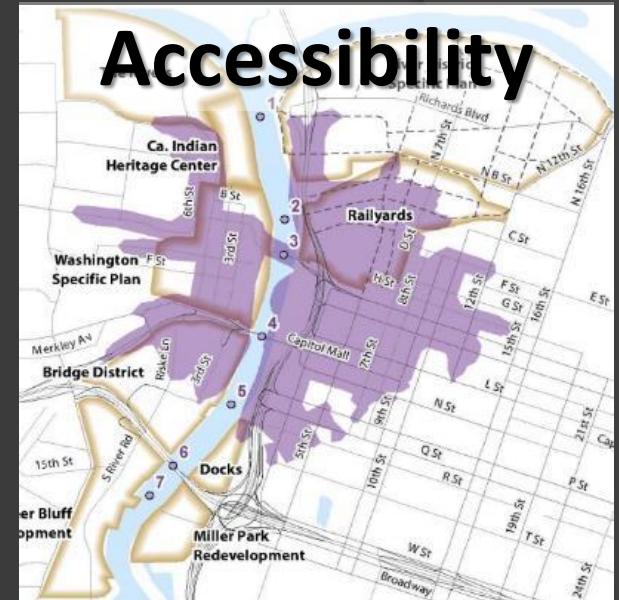
2003



GOVERNOR'S OFFICE OF PLANNING AND RESEARCH

## What SB 743 Does Not Do

No change to general plans, traffic impact fee programs, State Constitution, subdivision map act, etc.



# What SB 743 Proposes To Do

Changes the definition of the  
problem

# 2010 California Regional Transportation Plan Guidelines



California Transportation Commission



# TRIP GENERATION HANDBOOK

3rd Edition • An ITE Proposed Recommended Practice



August 2014  
Institute of Transportation Engineers

GETTING TRIP GENERATION RIGHT  
Eliminating the Bias Against Mixed Use Development

By Jerry Walters, Brian Bochner, and Reid Ewing



American Planning Association  
Making Great Communities Happen

# Transportation Analysis Evolution...

New Problem, New Focus

# Single-Family Detached Housing (210)

Average Vehicle Trip Ends vs: Dwelling Units (On a Weekday)

Number of Studies: **350**

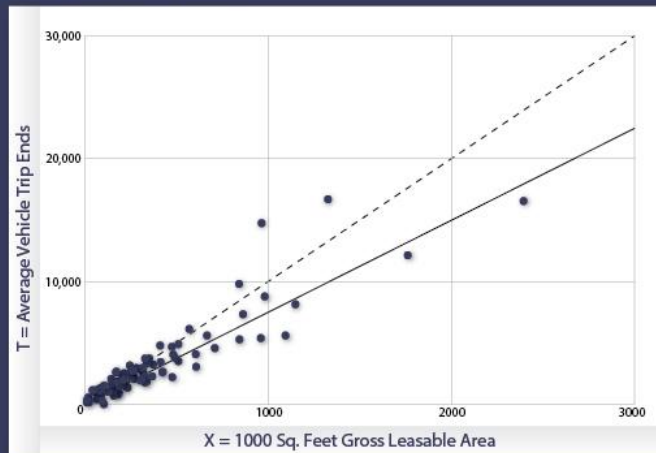
Avg. Number of Dwelling Units: **197**

Directional Distribution: **50% entering - 50% exiting**

## Trip Generation per Dwelling Unit

Average Rate: **9.57** | Range of Rates **4.31 to 21.85** | Standard Deviation **3.69**

## Data Plot and Equation



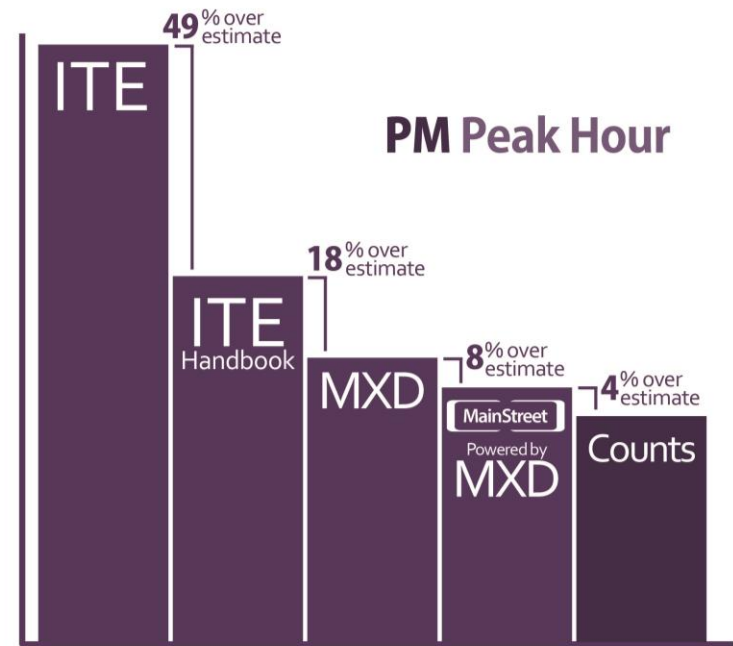
X Actual Data Points

— Fitted Curve

- - - Average Rate

Fitted Curve Equation:  $\ln(T) = 0.65 \ln(X) + 5.83$

$R^2 = 0.78$



# Focus on Trip Generation...

New Research

Density



Diversity



Design



Destinations



Distance to Transit



Development Scale



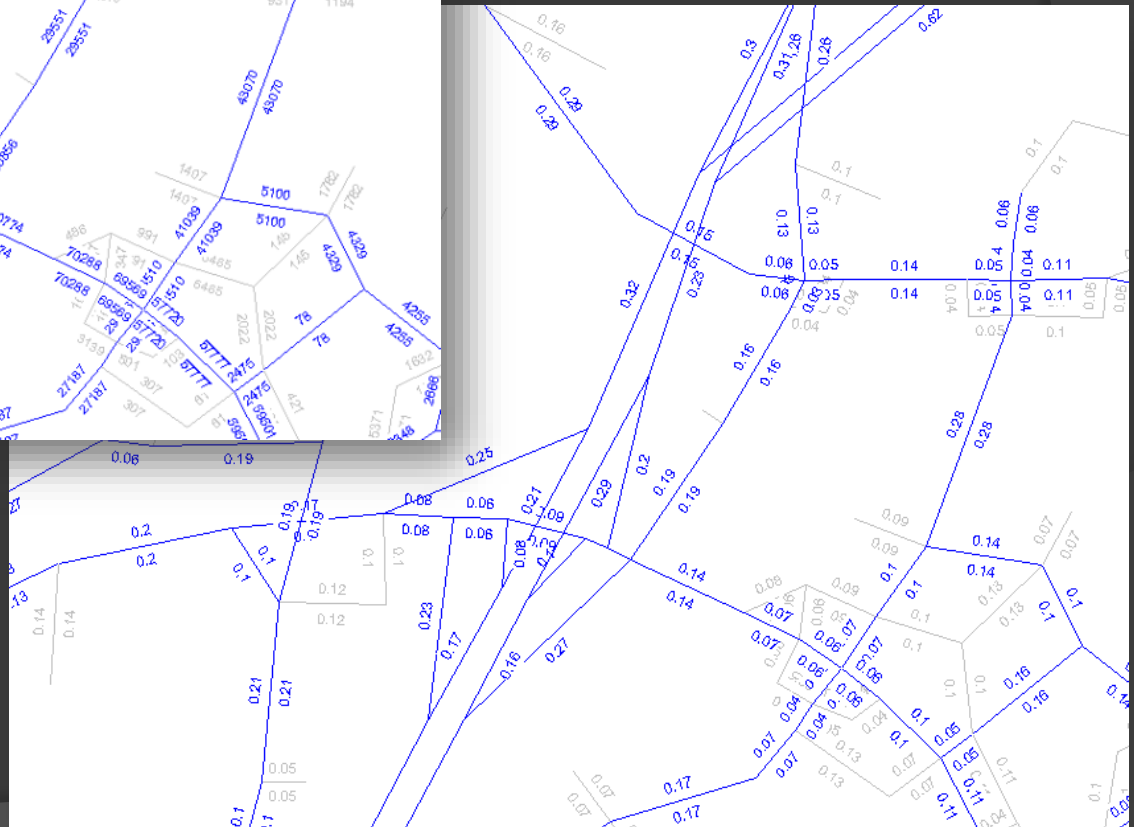
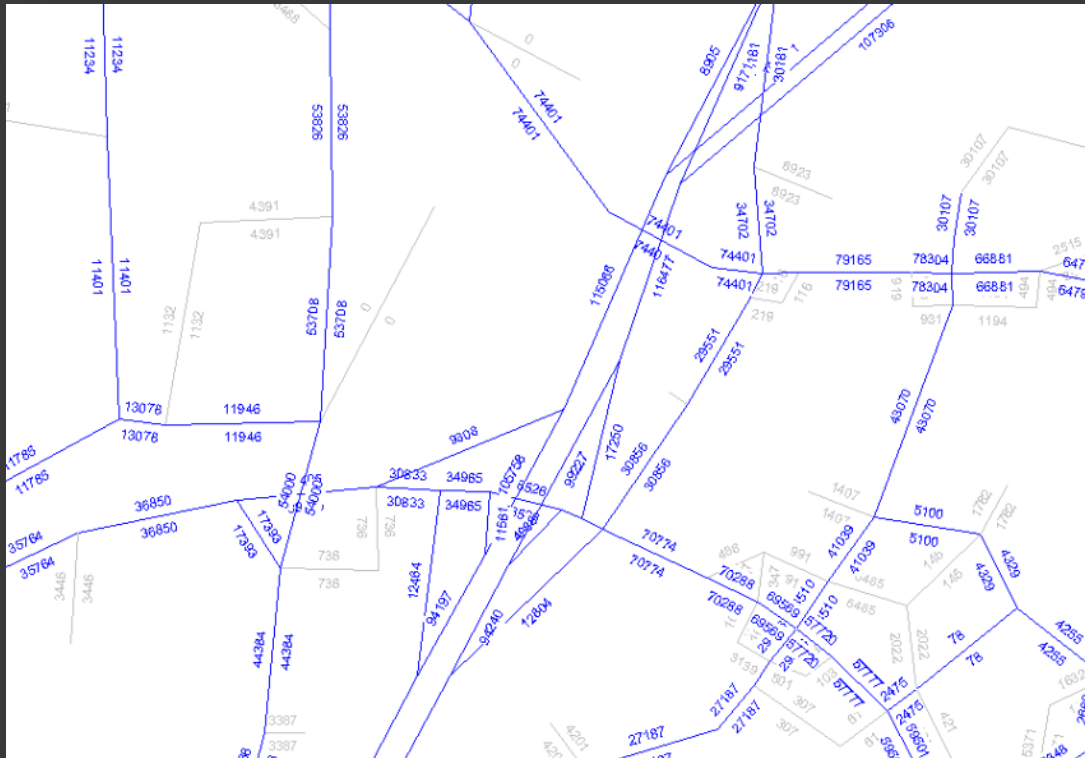
Demographics



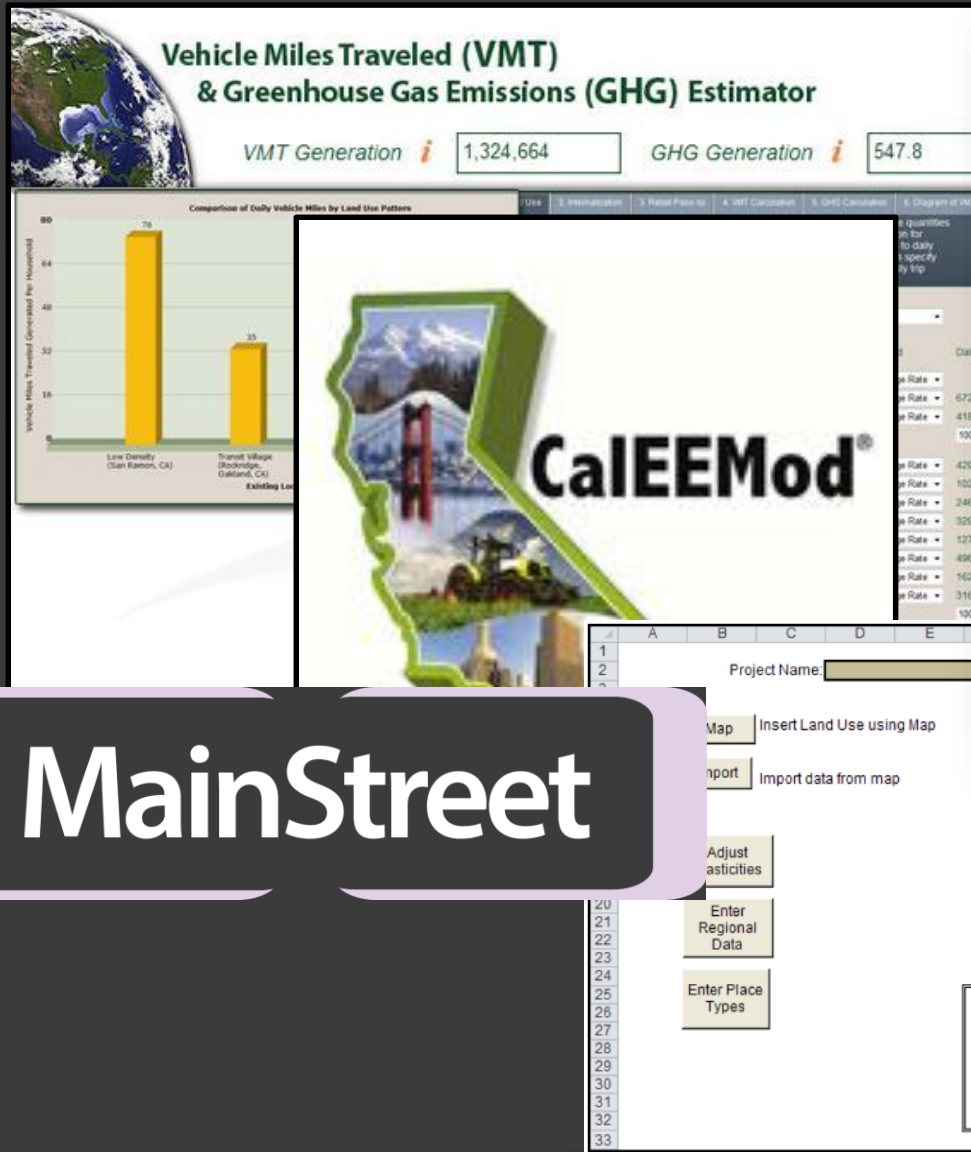
7Ds

That influence Trip  
Generation (and VMT)

# VMT = Volume (or Trips) x Distance



# “Other” VMT Models



**MainStreet**

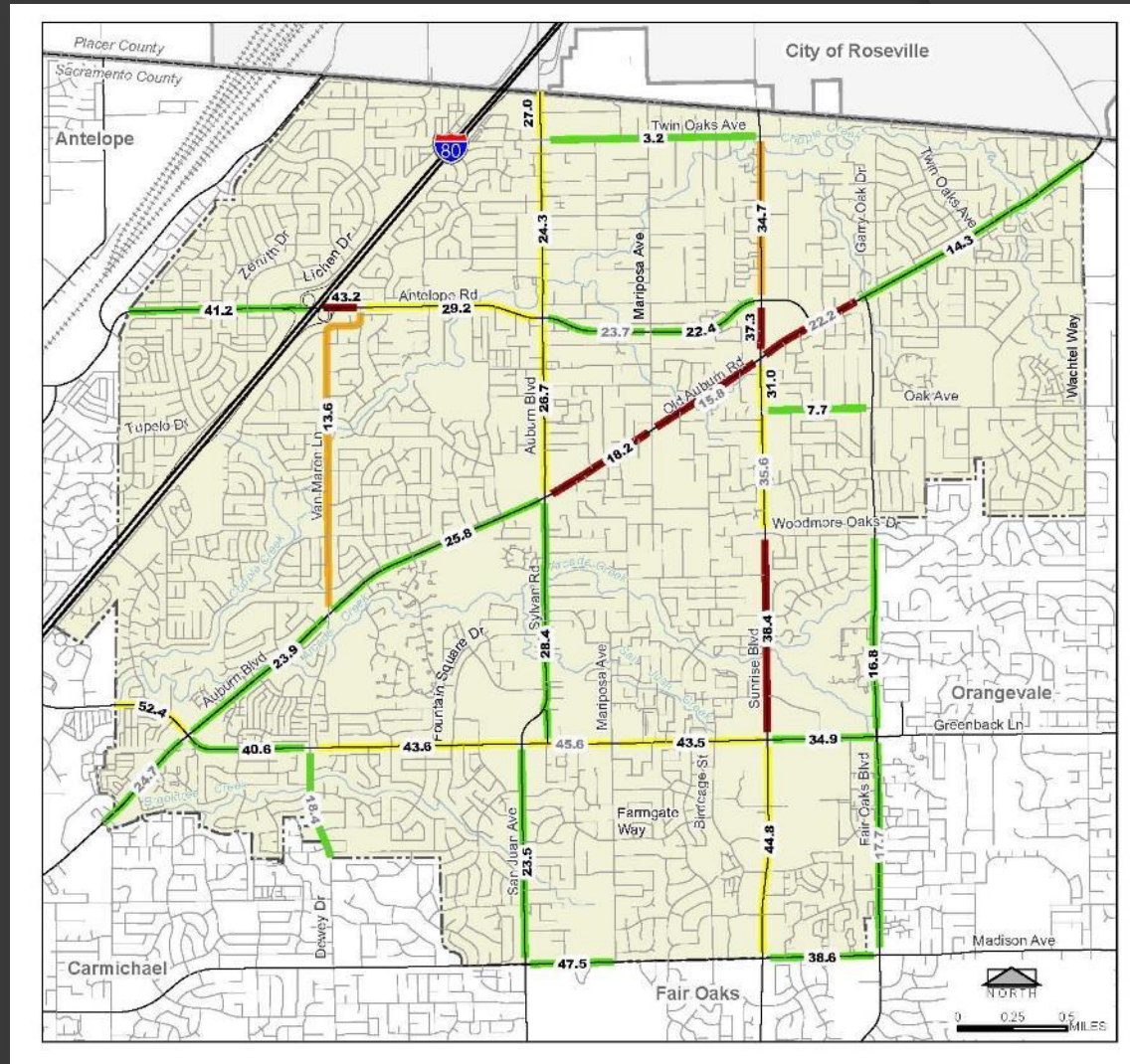
**SKETCH7**

A sketch level comparison of land use and travel using 7 D's: Density, Diversity, Distance, Design, Destination, Demographics, and Development Scale

Sketch7 is a land use scenario comparison tool. It conducts a sketch level analysis of a transportation relationship using 7 D's: density, diversity, distance, design, destination, demographics, and development scale. It looks at how a land use scenario differs from an existing use scenario, comparing the two on land metrics like number and types of land uses, densities, and the mix of uses. The tool also compares the scenarios on travel metrics. On the scale of the project, can provide estimates on vehicle miles traveled.

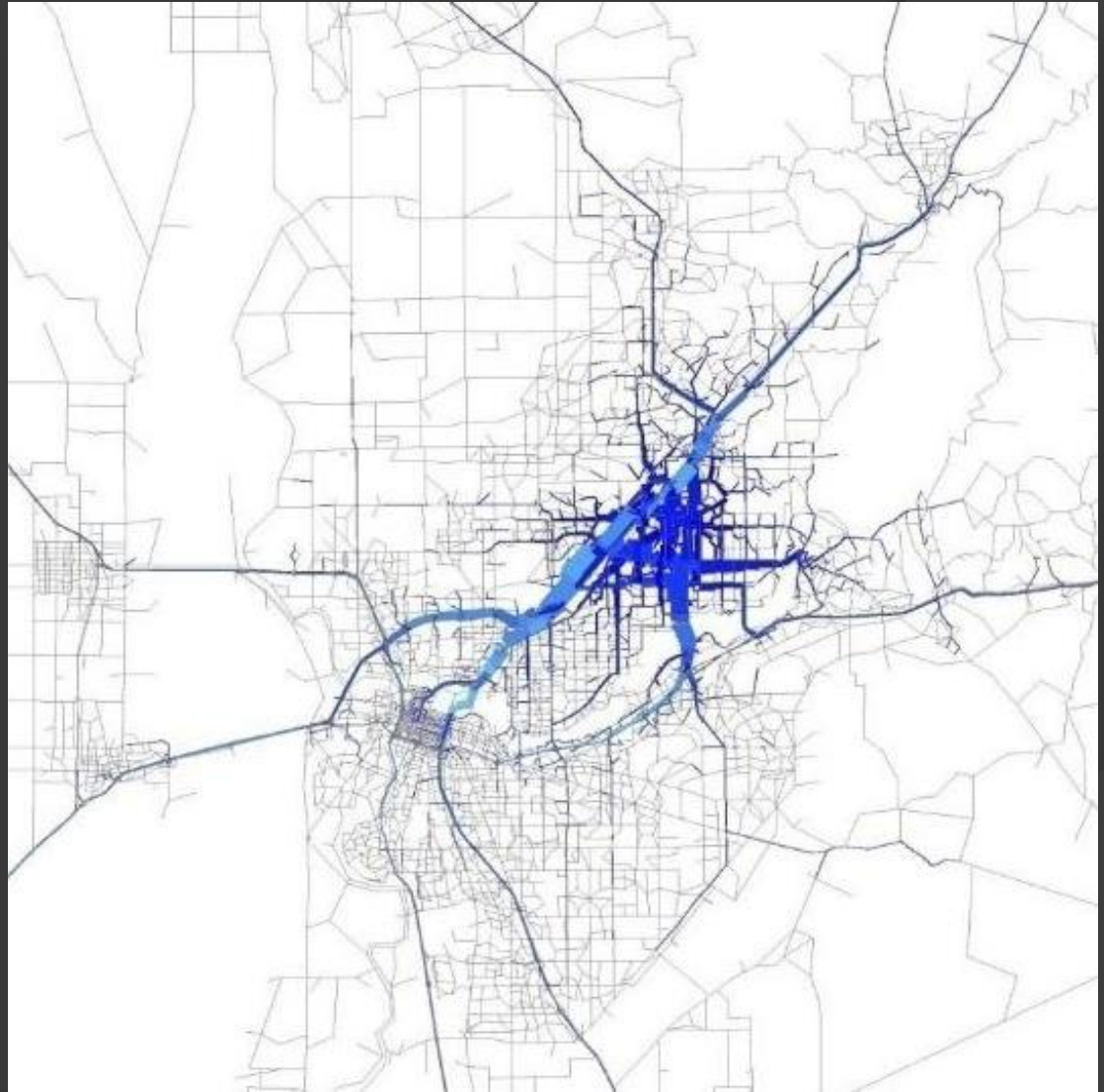
# Boundary VMT Method

- **Citrus Heights = 1,000,110 daily VMT (weekday)**



# Origin-Destination VMT Method

- Citrus Heights =  
1,397,340 daily VMT  
(weekday)



# VMT Full Accounting

Trip Length Estimates	Average Trip Length by Trip Purpose		
	HBO	HBS	HBW
CalEEMod	7.50	7.30	10.80
VMT Spreadsheet Model	7.22	7.22	12.54
MPO Travel Forecasting Model	7.26	7.26	5.87
<u>Notes:</u> HBO = Home-Based Other HBS = Home-Based Shopping HBW = Home-Based Work			

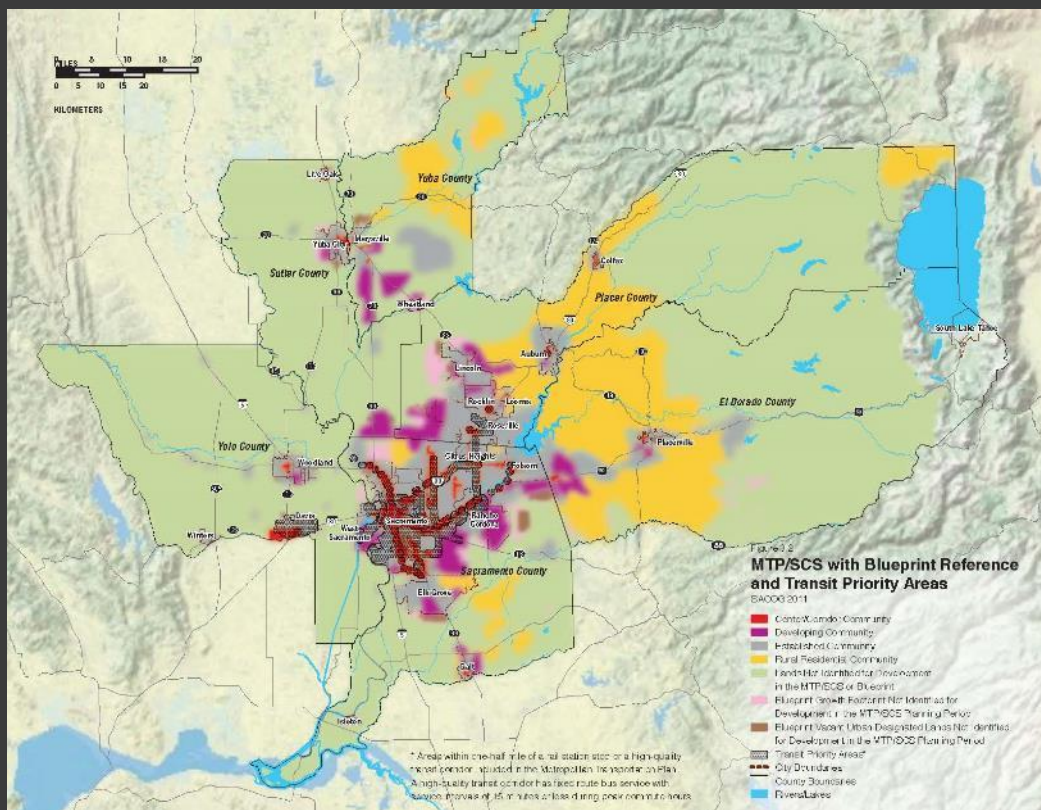
**Development  
Project VMT**

**Infrastructure  
Project VMT**



## **VMT Thresholds**

**What is acceptable VMT?**



# RTP/SCS Consistency

Should VMT analysis  
start here?

## Development Project VMT



- Governor's Executive Orders
- SB 375 Targets
- Caltrans Strategic Management Plan target

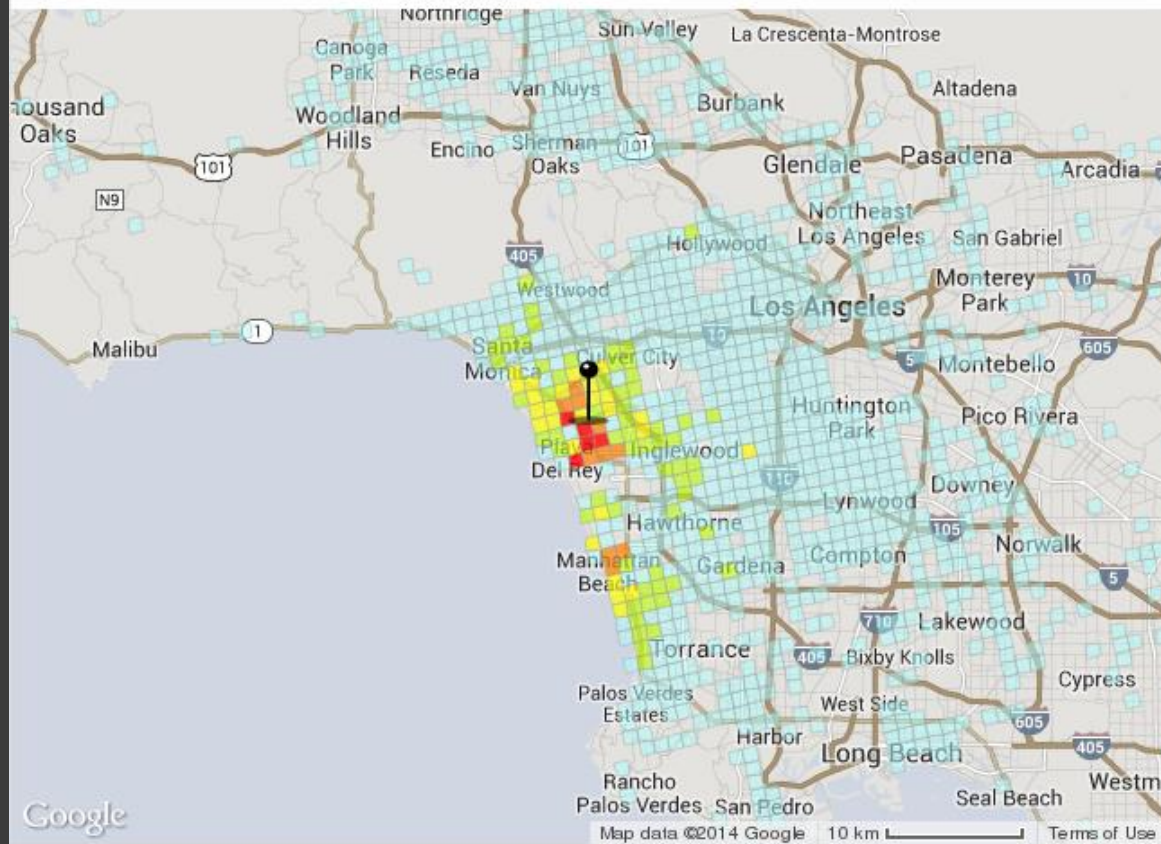
## Justification for thresholds

What is the substantial evidence?

? LA12-2416\_playa | Home Places | Average Weekday | All-Day

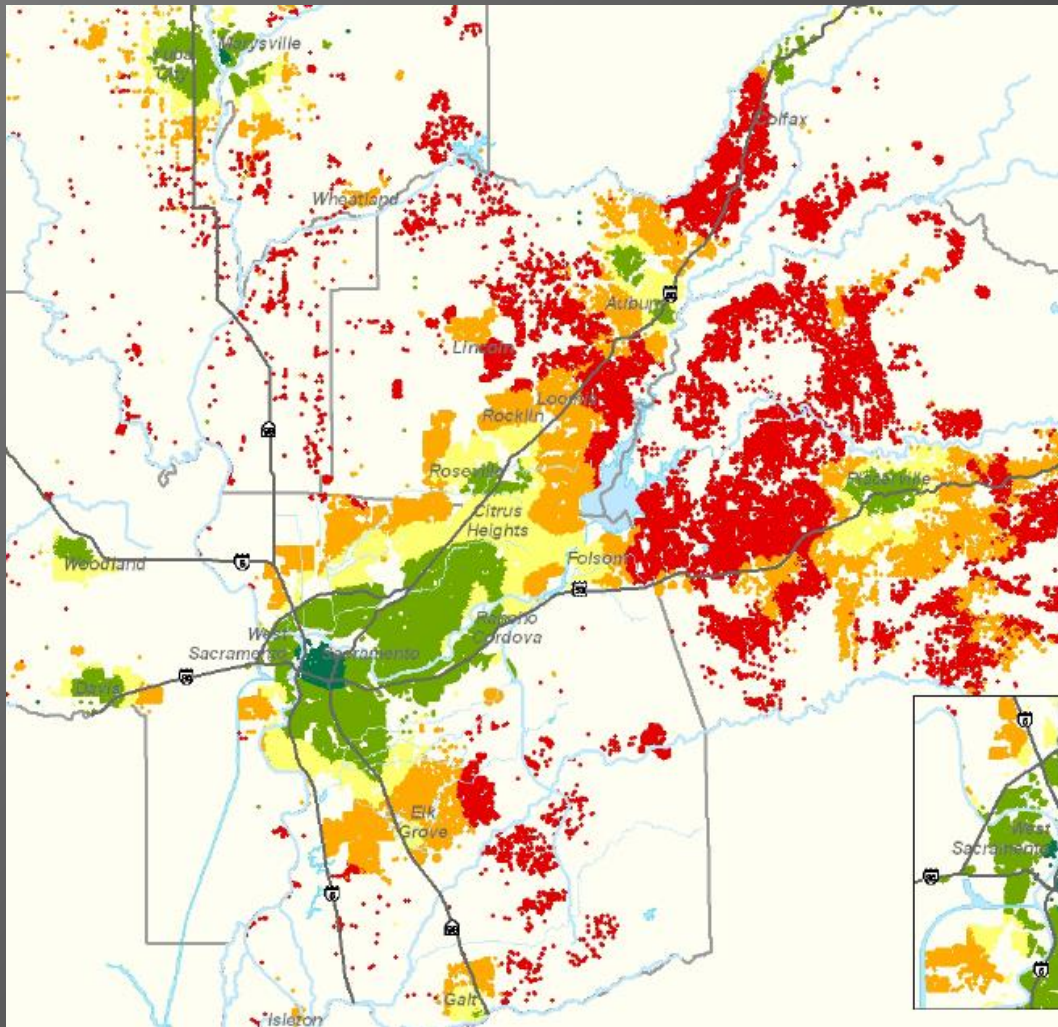
Colors indicate the percent of total visitors to the site who live or work in that 1 km<sup>2</sup> grid cell.

0.01 - 0.19% 0.2 - 0.43% 0.44 - 0.71% 0.72 - 1.27% 1.28% or more.



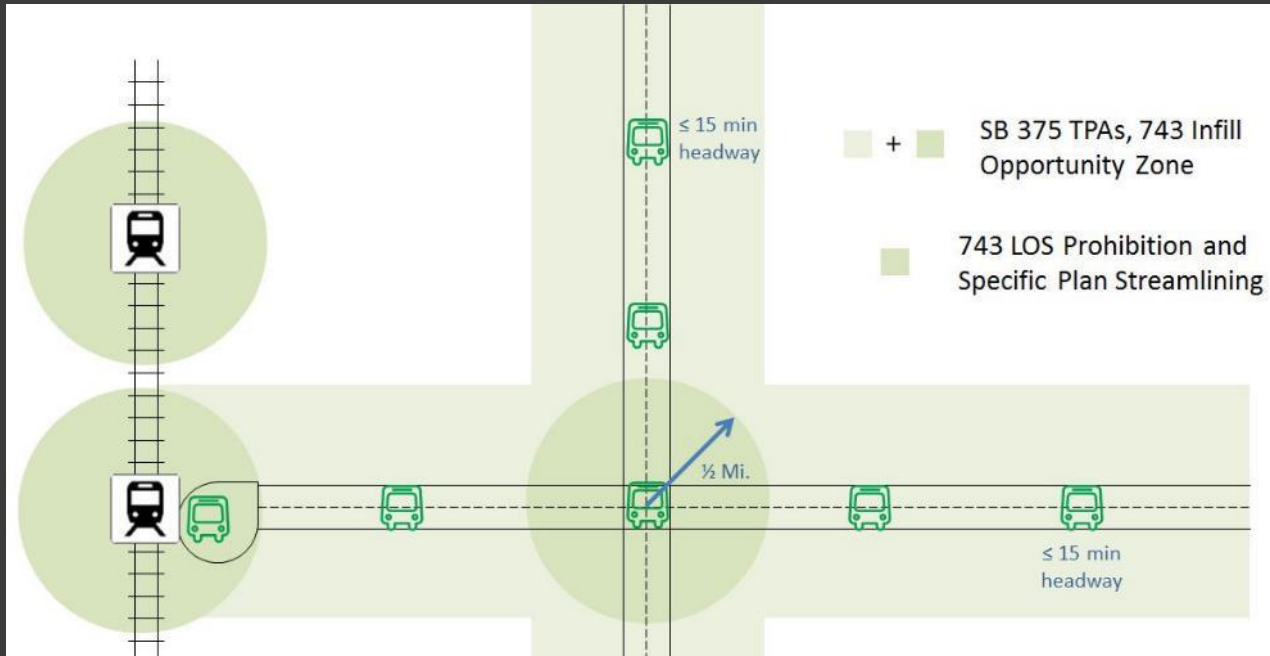
## VMT by Land Use Type

How should it be calculated?



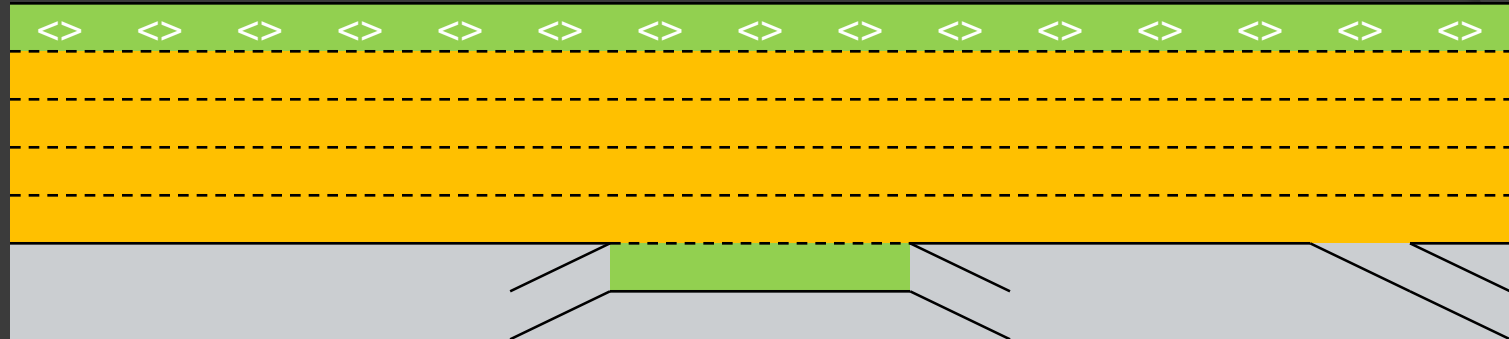
Source: SACOG

**Residential VMT**  
**Home-based or Household**  
**Generated?**



# Streamlining

Is mapped based review appropriate?



**General Purpose lanes vs.  
Managed or Auxiliary lanes**

# Induced Travel

How much discretion will  
lead agencies have?

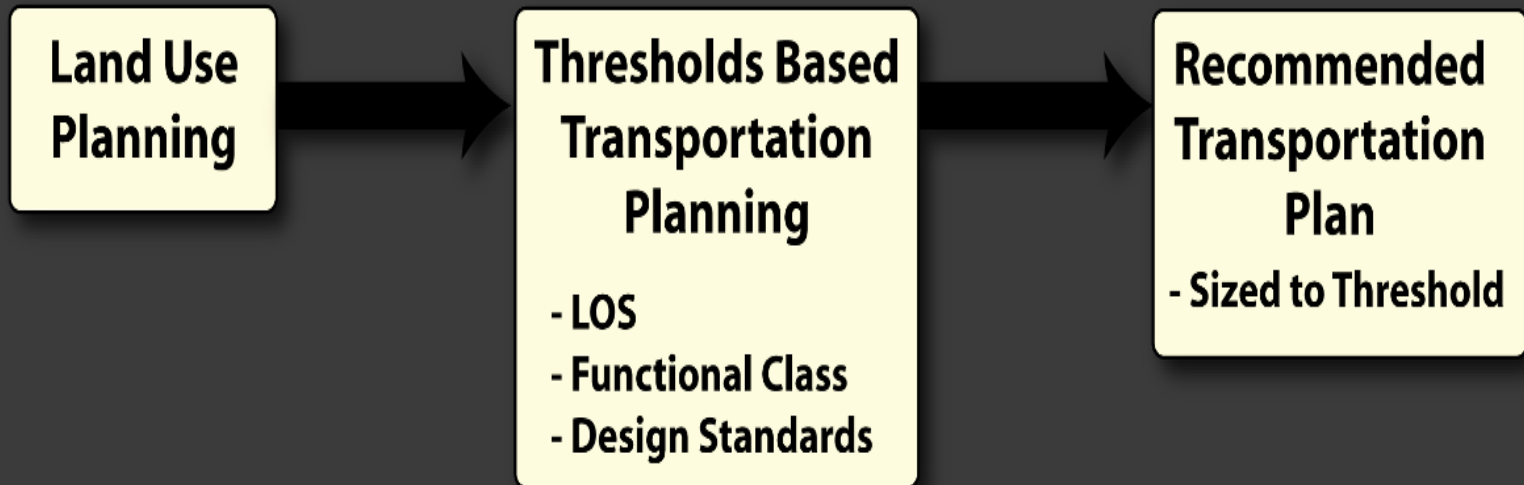
# Timeline for Adoption

- Summer/Fall – 2<sup>nd</sup> Draft of Guidelines
- Final Draft to Natural Resource Agency for Rulemaking (~6 months)
- Implementation in late 2016

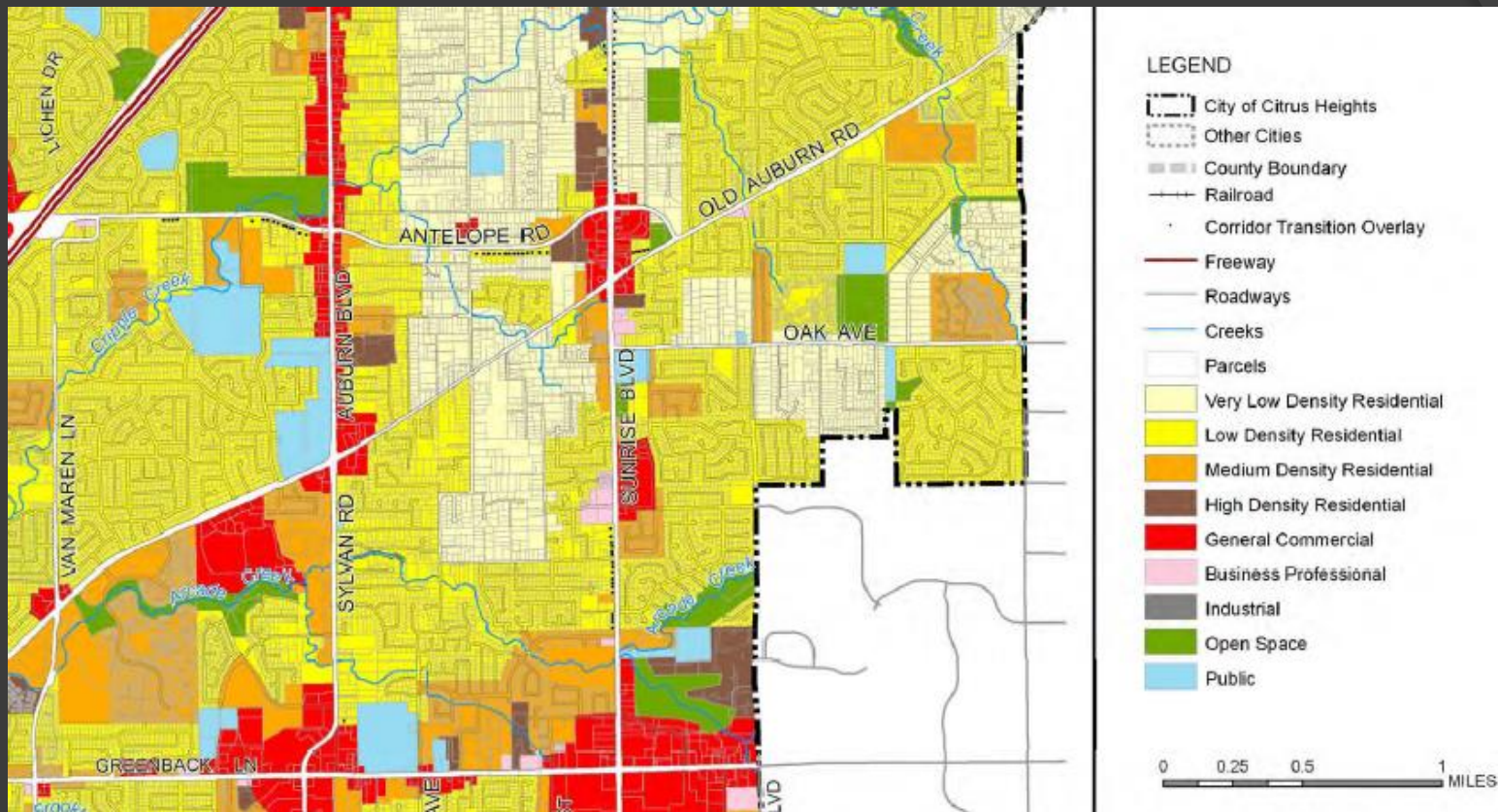
Ron Milam, AICP, PTP, Principal  
[r.milam@fehrandpeers.com](mailto:r.milam@fehrandpeers.com)

**Thanks!**

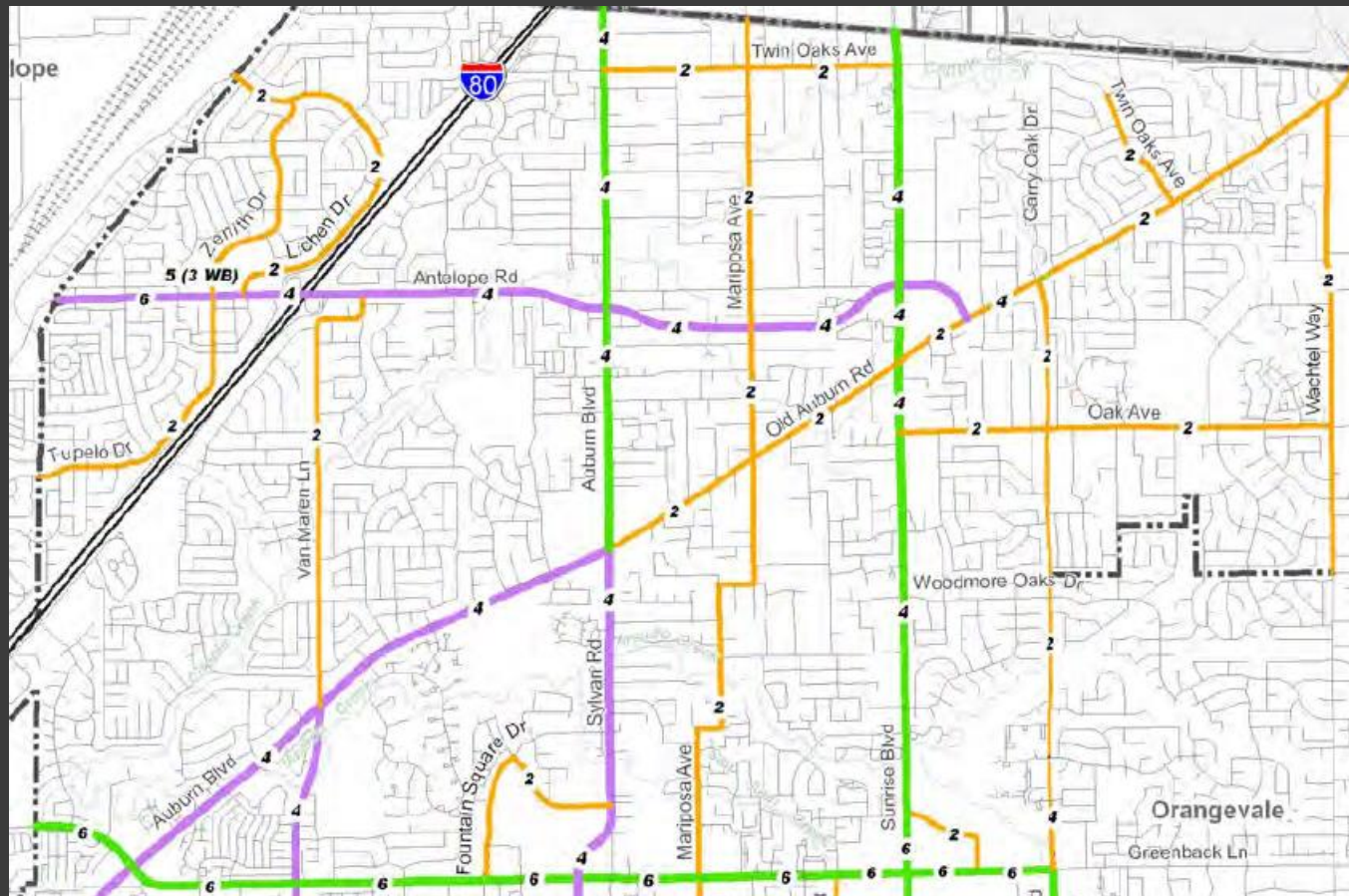
# Extra Slides for Q&A



**Traditional  
Planning  
Process**



# Land Use Plan Example



# Transportation Plan Example

# The Role of LOS

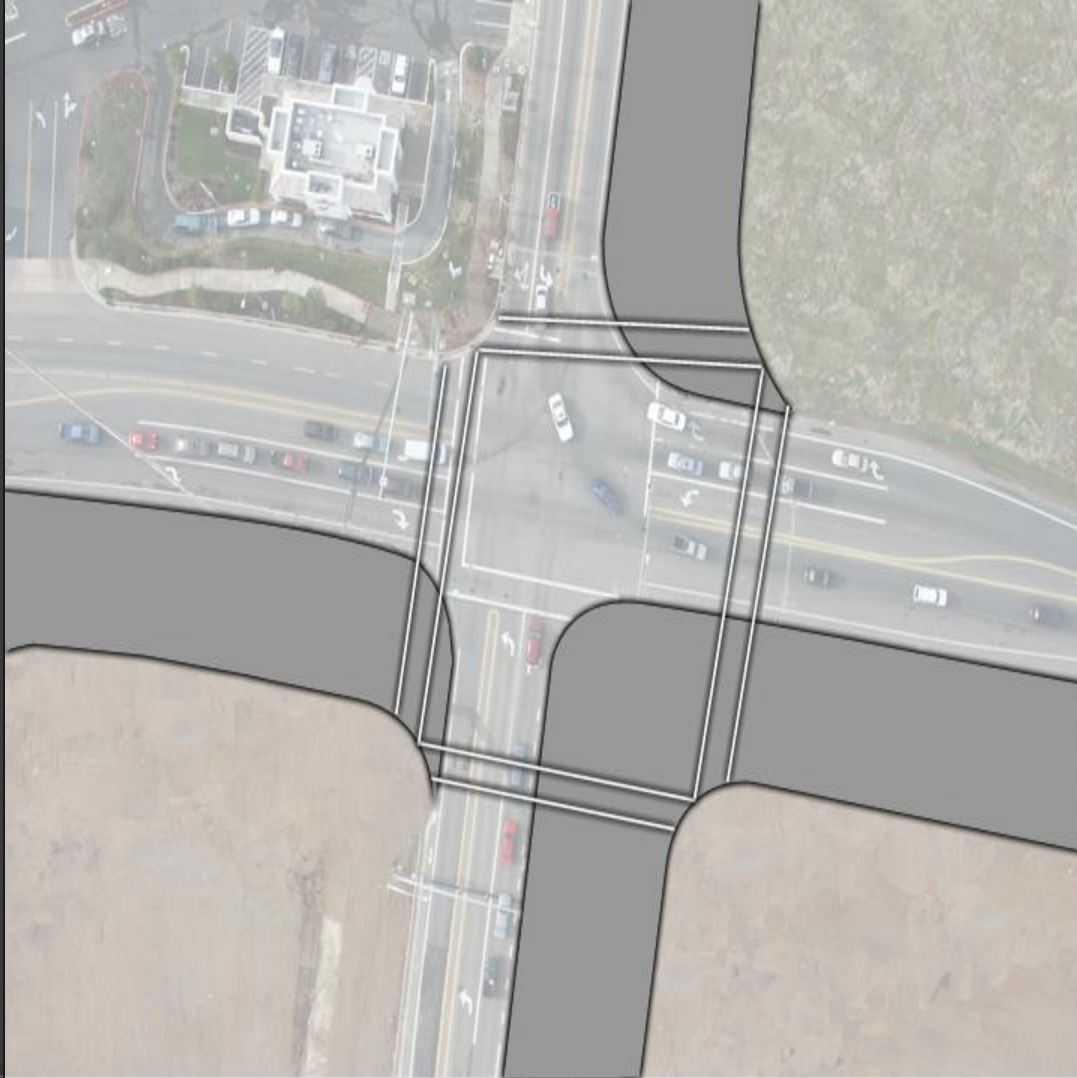
To a driver: LOS A  
To an economist: LOS F



To a driver: LOS F  
To an economist: LOS A



# Consequences of Current Practice



- LOS mitigation usually requires expansion of the network
- LOS based analysis generates impacts to other modes and the environment
- LOS mitigation increases public long-term O&M costs

# Consequences of Current Practice



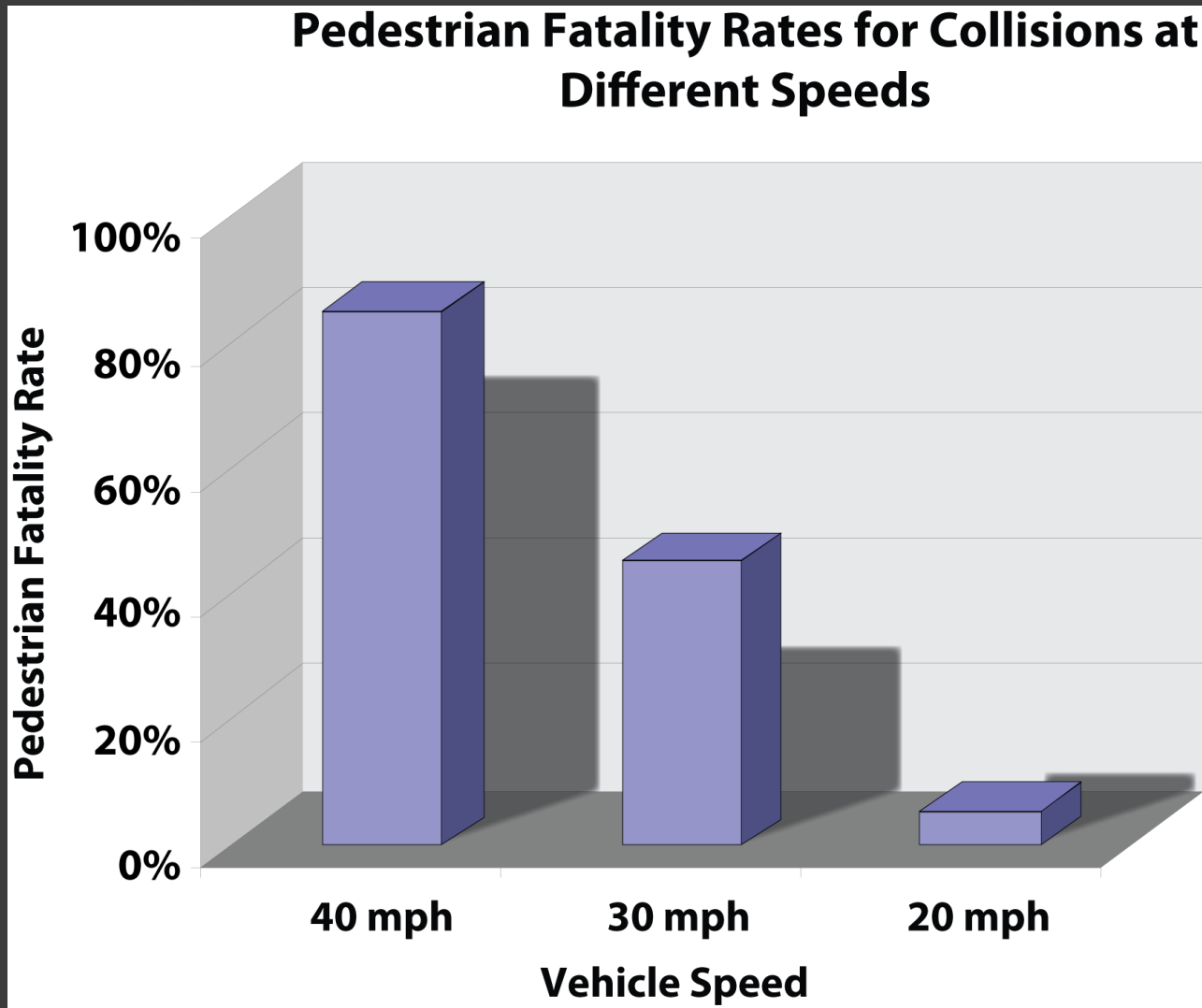
At **40 mph** the driver's focus is on the roadway in the distance.



At **30 mph** the driver begins to see things at the road edges in the background.

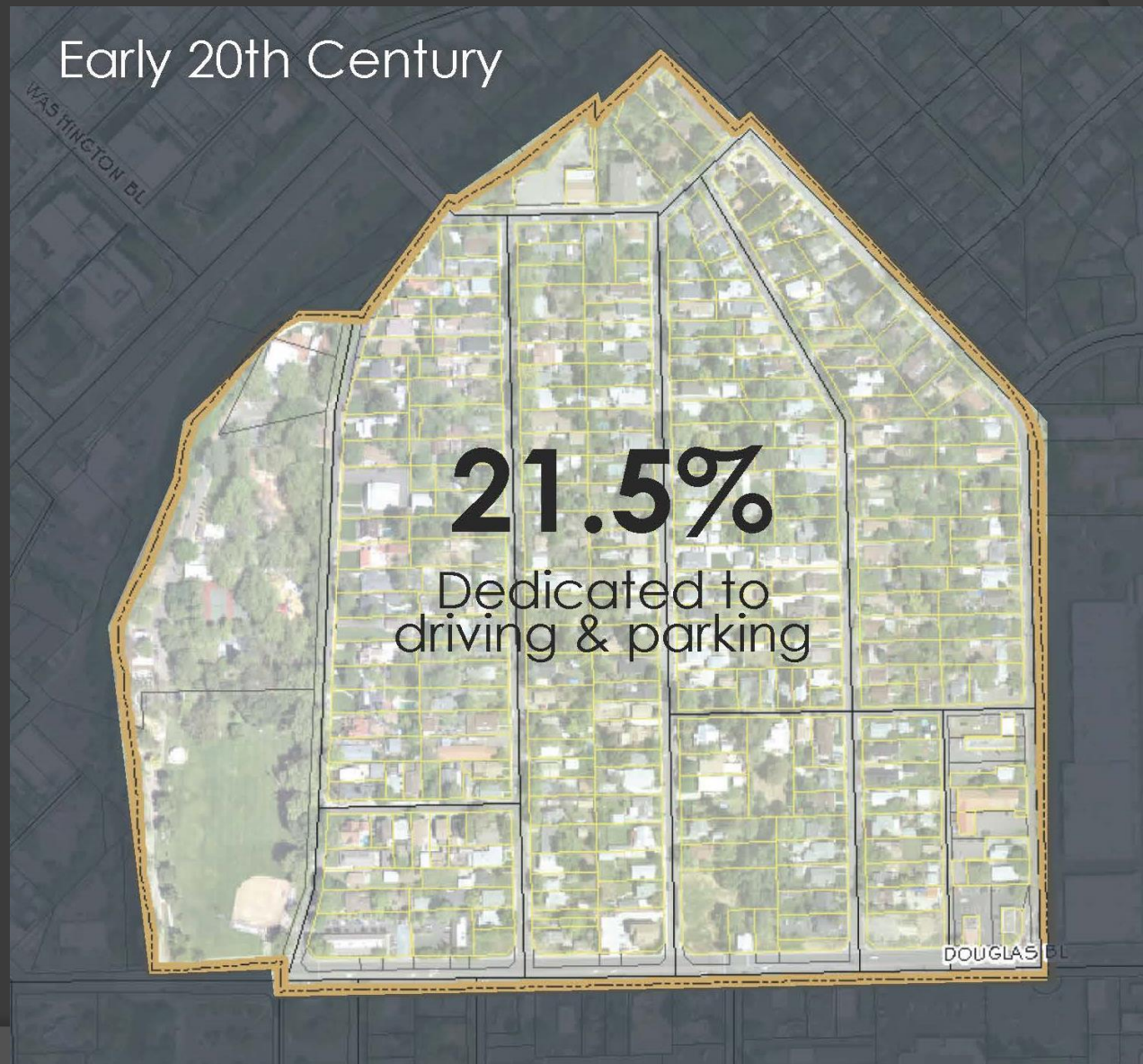
Source: Smart Mobility Framework, Caltrans, 2009

# Consequences of Current Practice



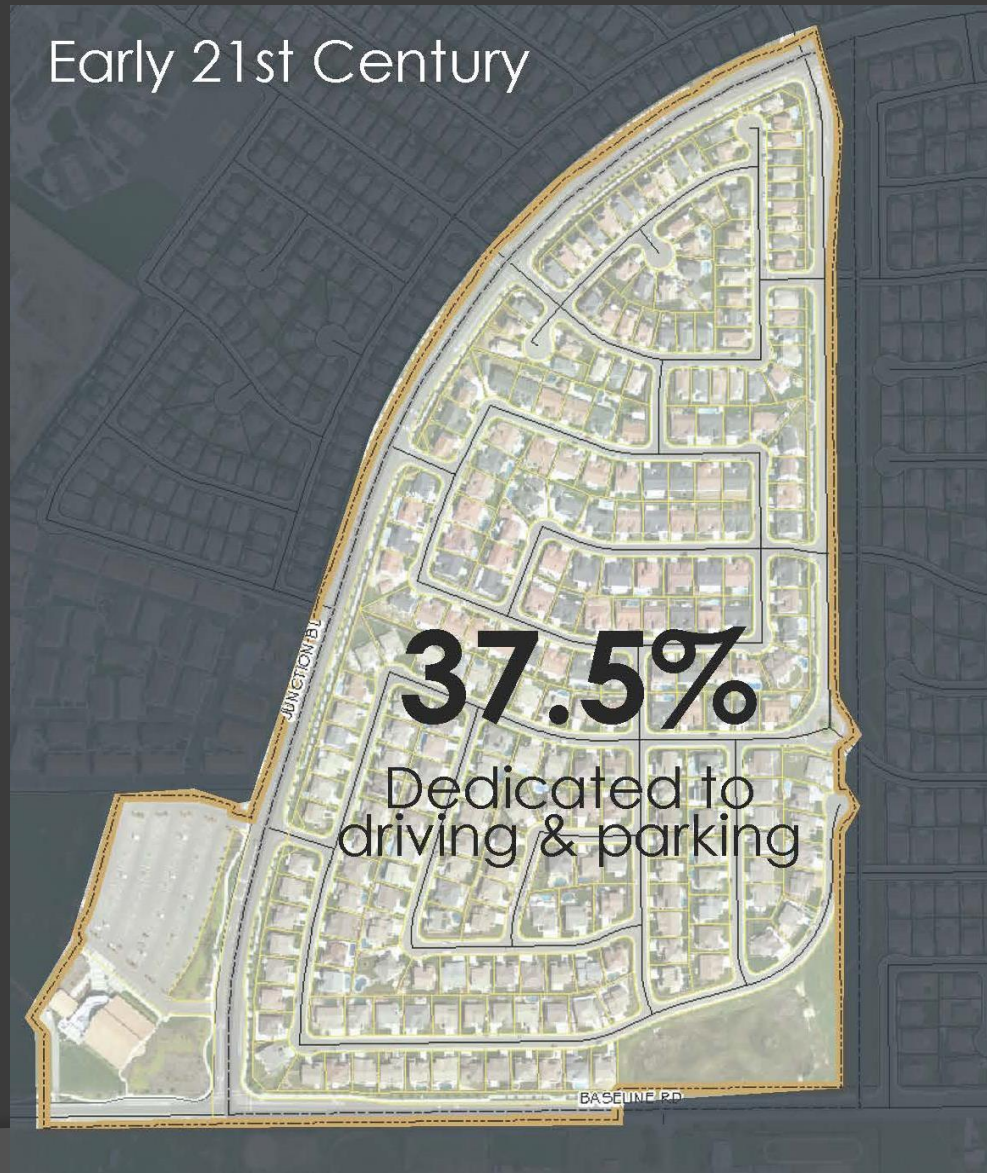
Source: The Built Environment and Traffic Safety - A Review of Empirical Evidence,  
Journal of Planning Literature, Volume 23 Number 4, May 2009  
By Reid Ewing and Eric Dumbaugh

# Urban Form Consequences



# Urban Form Consequences

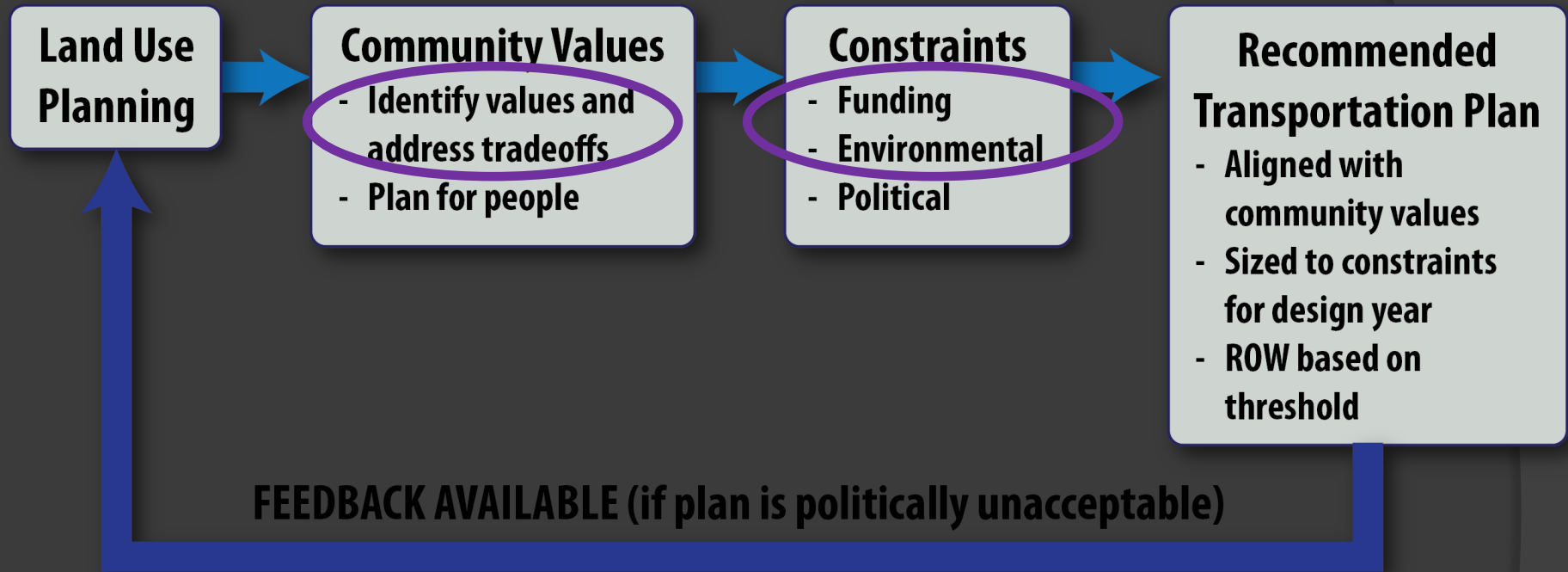
Early 21st Century



# Case Study – City of Manteca

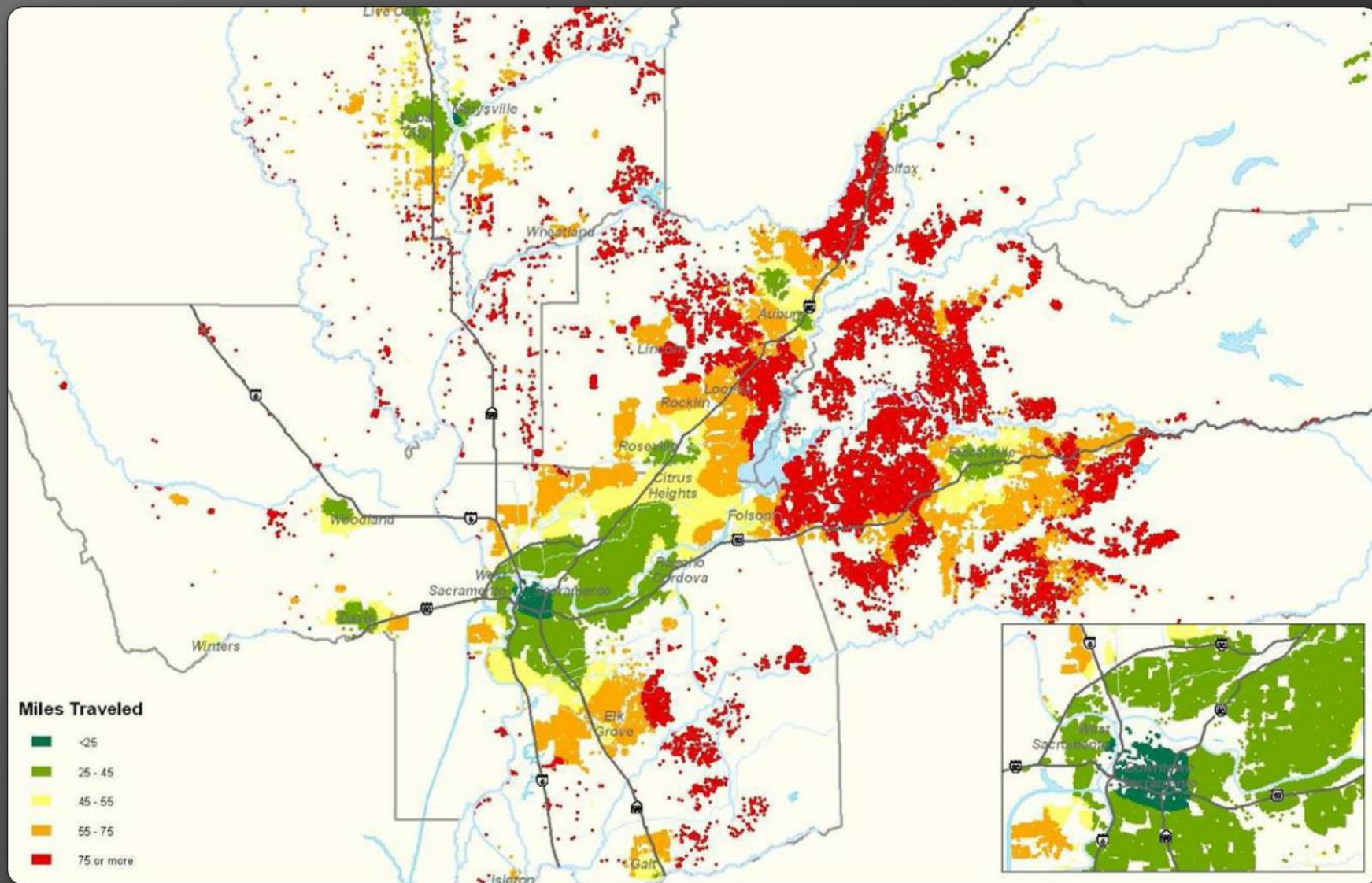


Current fee imposed per DUE	Fee to meet LOS C threshold
\$5,400/DUE	\$37,000/DUE

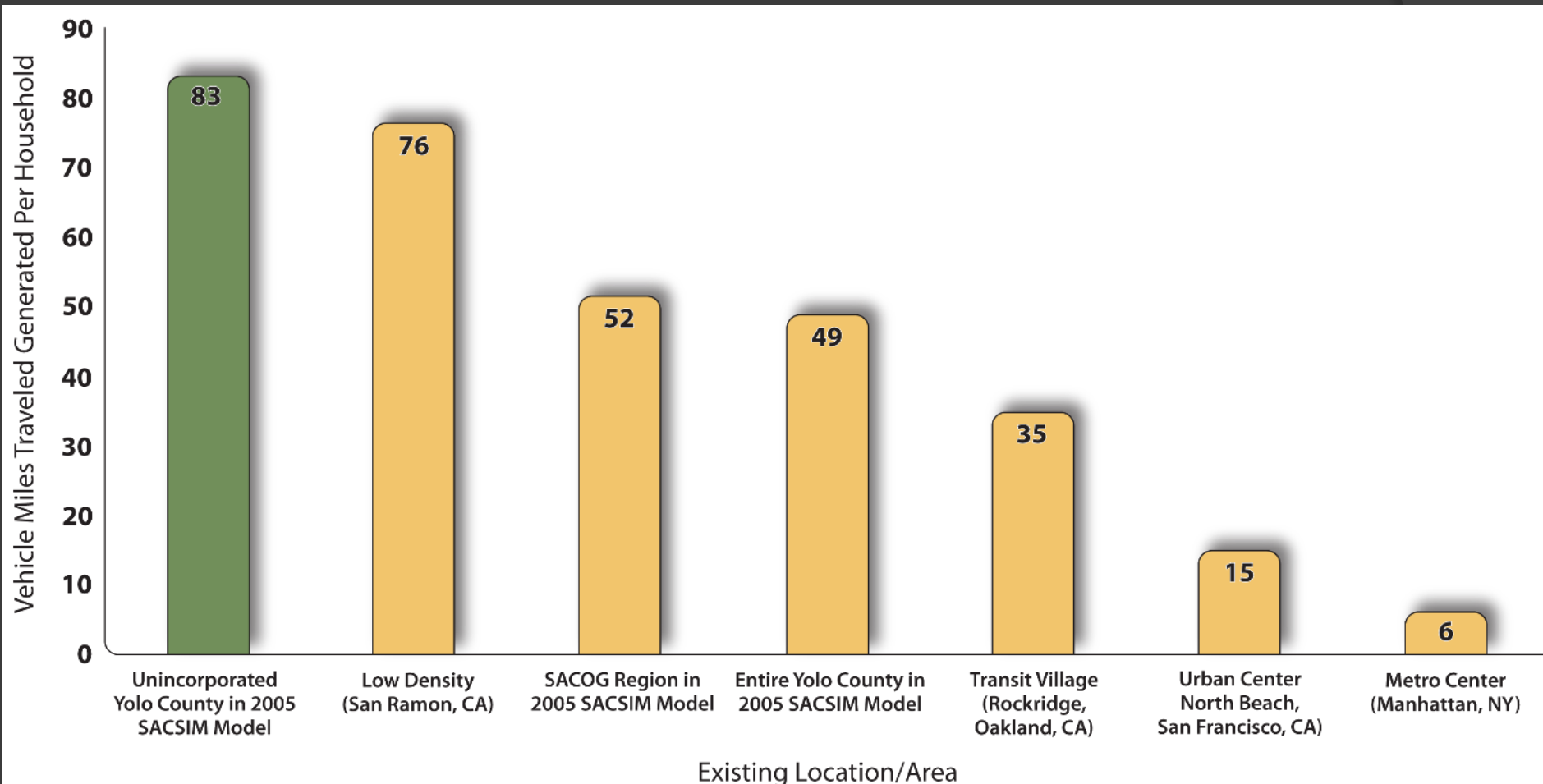


## The New Planning Paradigm - Shifting the Process

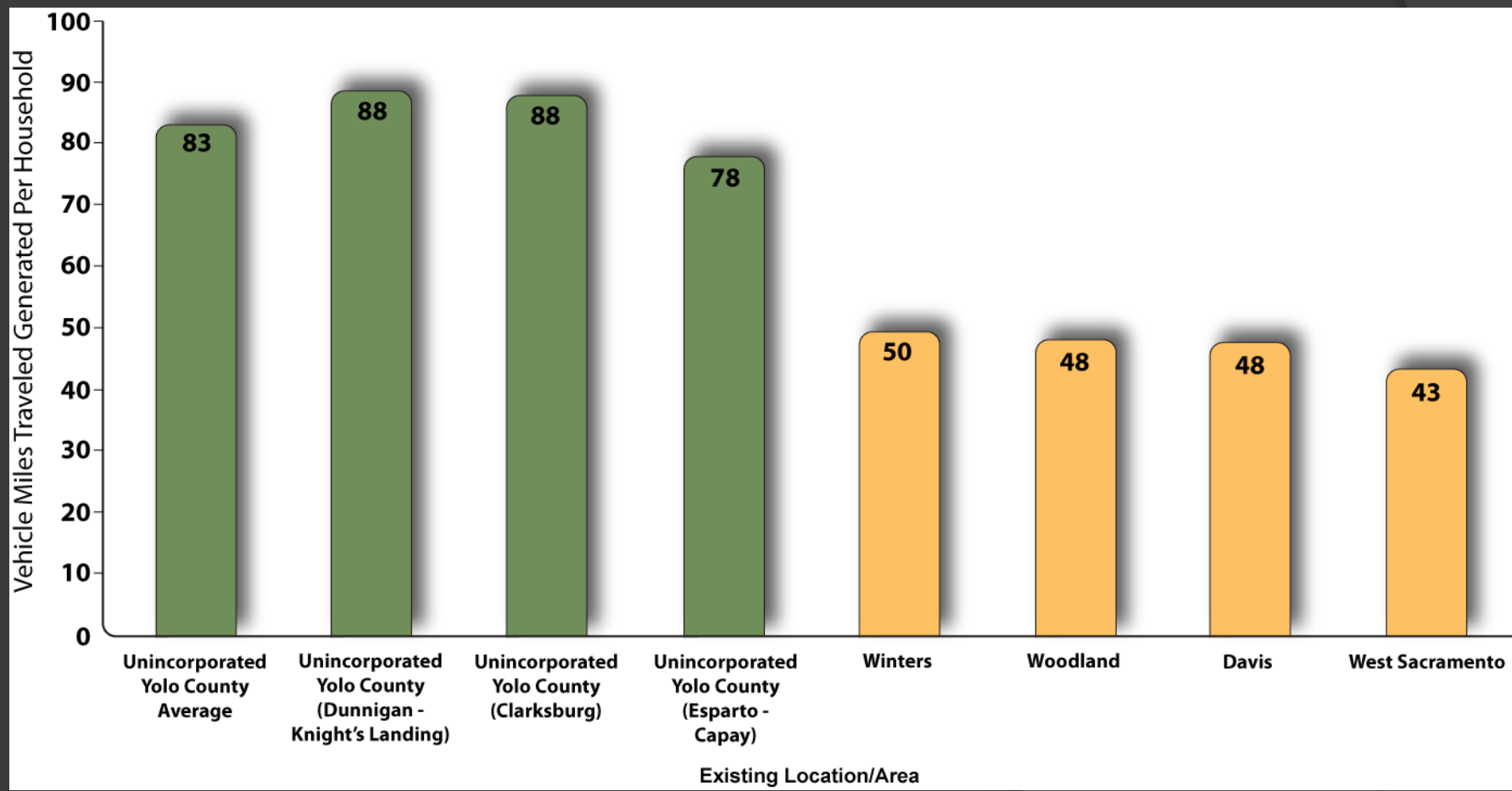
# Yolo County Case Study



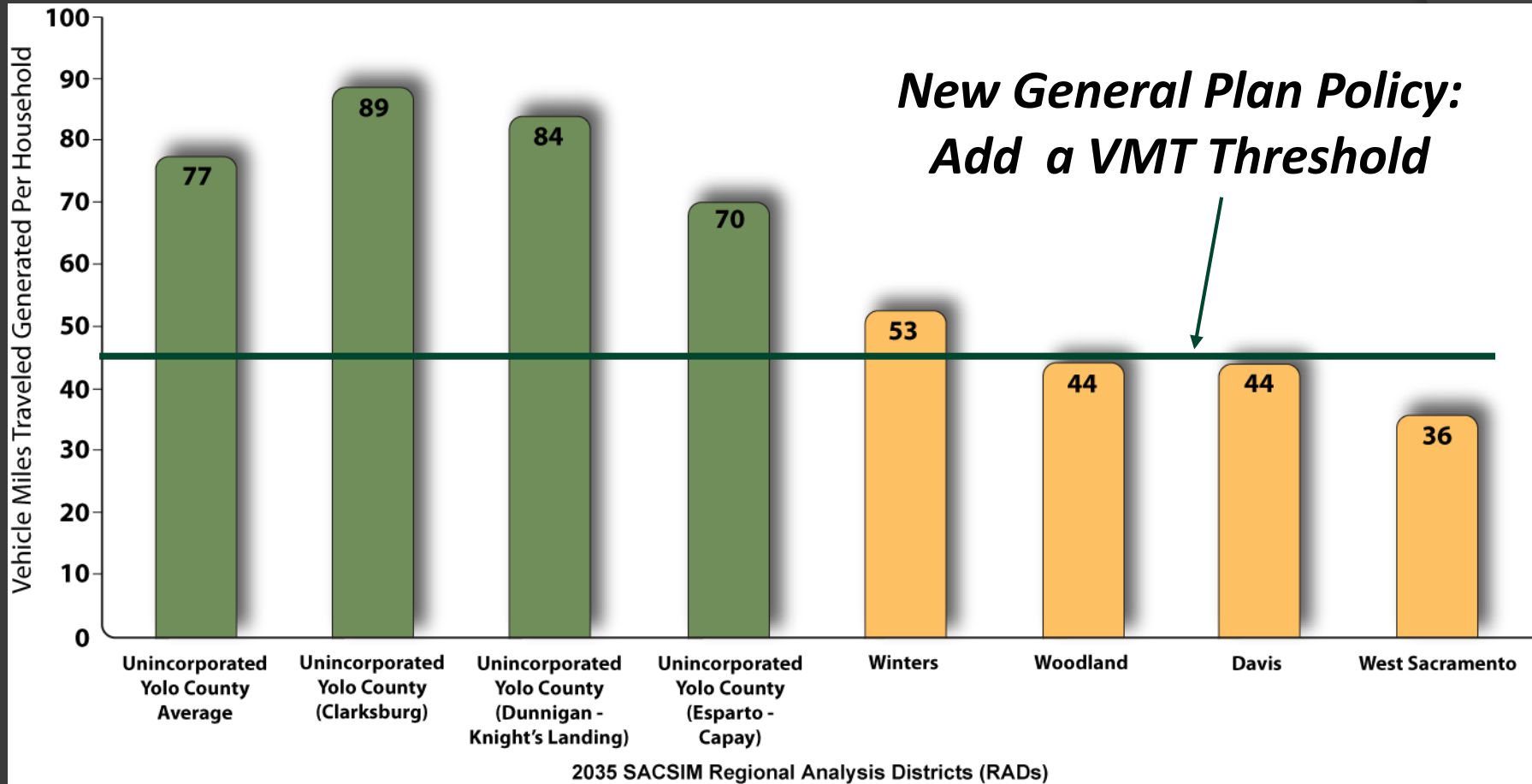
# Comparison of Daily HH VMT by Land Use Pattern



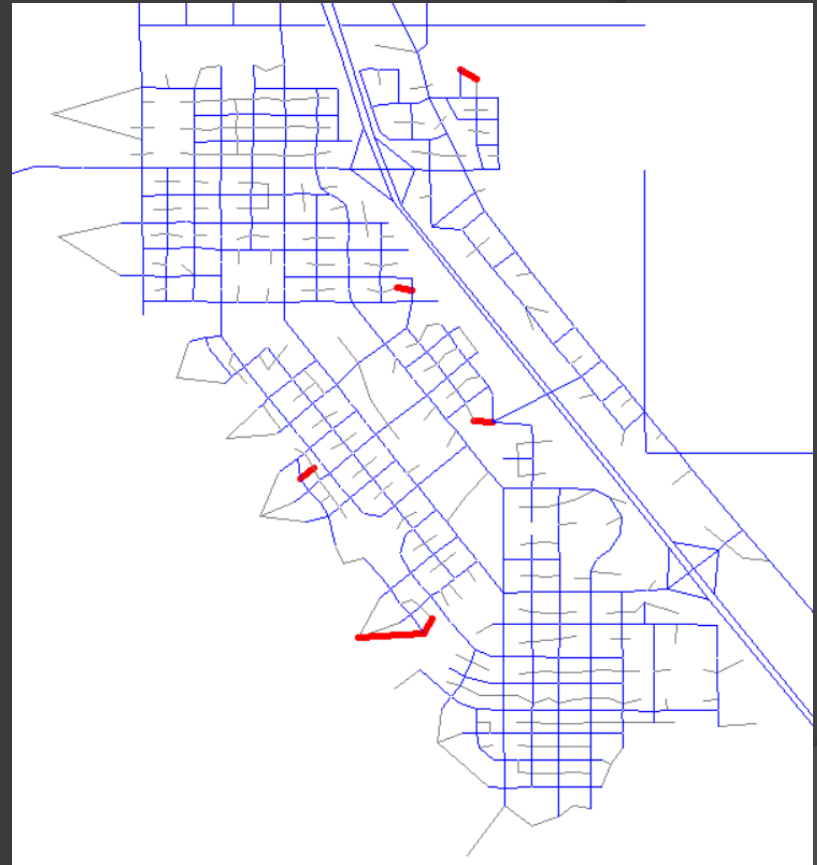
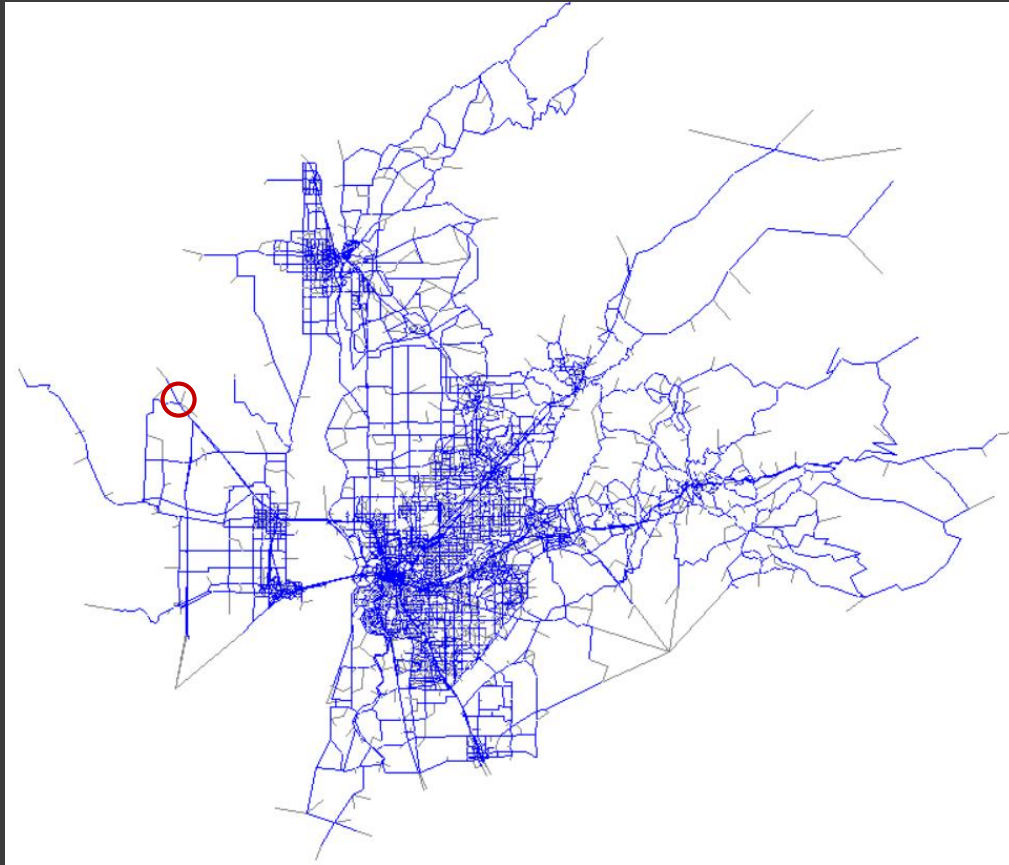
# 2005 Daily VMT for Yolo County



# 2035 Daily VMT for Yolo County



# Dunnigan Specific Plan



# Dunnigan Specific Plan

Trip Type	Internal Percent	External Percent	VMT	VMT/HH
HBW	47%	53%	168,984	19
HBS	80%	20%	73,307	8
HBSc	90%	10%	9,327	1
HBO	80%	20%	153,330	17
OO	80%	20%	40,303	4
Total	<b>74%</b>	<b>26%</b>	<b>445,251</b>	<b>49</b>

# Dunnigan Specific Plan

## Chapter 6



**Chart 6-2: Transportation Strategies Organization**

Transportation Measures (Five Subcategories) Global Maximum Reduction (all VMT): urban = 75%; compact infill = 40%; suburban center or suburban with NEV = 20%; suburban = 15%					Global Cap for Road Pricing needs further study
Transportation Measures (Four Categories) Cross-Category Max Reduction (all VMT): urban = 70%; compact infill = 35%; suburban center or suburban with NEV = 15%; suburban = 10%					Max Reduction = 25% (all VMT)
Land Use / Location	Neighborhood / Site Enhancement	Parking Policy / Pricing	Transit System Improvements	Commute Trip Reduction (assumes mixed use) Max Reduction = 25% (work VMT)	Road Pricing Management
Max Reduction: urban = 65%; compact infill = 30%; suburban center = 10%; suburban = 5%	Max Reduction: without NEV = 5%; with NEV = 15%	Max Reduction = 20%	Max Reduction = 10%		Max Reduction = 25%
Density (30%)	Pedestrian Network (2%)	Parking Supply Limits (12.5%)	Network Expansion (8.2%)	CTR Program Required = 21% work VMT Voluntary = 6.2% work VMT	Cordon Pricing (22%)
Design (21.3%)	Traffic Calming (1%)	Unbundled Parking Costs (13%)	Service Frequency / Speed (2.5%)	Transit Fare Subsidy (20% work VMT)	Traffic Flow Improvements (45% CO2)
Location Efficiency (65%)	NEV Network (14.4) <NEV Parking>	On-Street Market Pricing (5.5%)	Bus Rapid Transit (3.2%)	Employee Parking Cash-out (7.7% work VMT)	Required Contributions by Project
Diversity (30%)	Car Share Program (0.7%)	Residential Area Parking Permits	Access Improvements	Workplace Parking Pricing (19.7% work VMT)	
Destination Accessibility (20%)	Bicycle Network <Lanes> <Parking> <Land Dedication for Trails>		Station Bike Parking	Alternative Work Schedules & Telecommute (5.5% work VMT)	
Transit Accessibility (25%)	Urban Non-Motorized Zones		Local Shuttles	CTR Marketing (5.5% work VMT)	
BMR Housing (1.2%)			Park & Ride Lots*	Employer-Sponsored Vanpool/Shuttle (13.4% work VMT)	
Orientation Toward Non-Auto Corridor				Ride Share Program (15% work VMT)	
Proximity to Bike Path				Bike Share Program	
				End of Trip Facilities	
				Preferential Parking Permit	
				School Pool (15.8% school VMT)	
				School Bus (6.3% school VMT)	
					Vehicles
					Electricity Loading Docks
					Utilize Alternative Fueled Vehicles
					Utilize Electric or Hybrid Vehicles

*Note: Strategies in bold text are primary strategies with reported VMT reductions; non-bolded strategies are support or grouped strategies.*

# Dunnigan Specific Plan

**Dunnigan Specific Plan Recommended VMT Reduction Strategies**

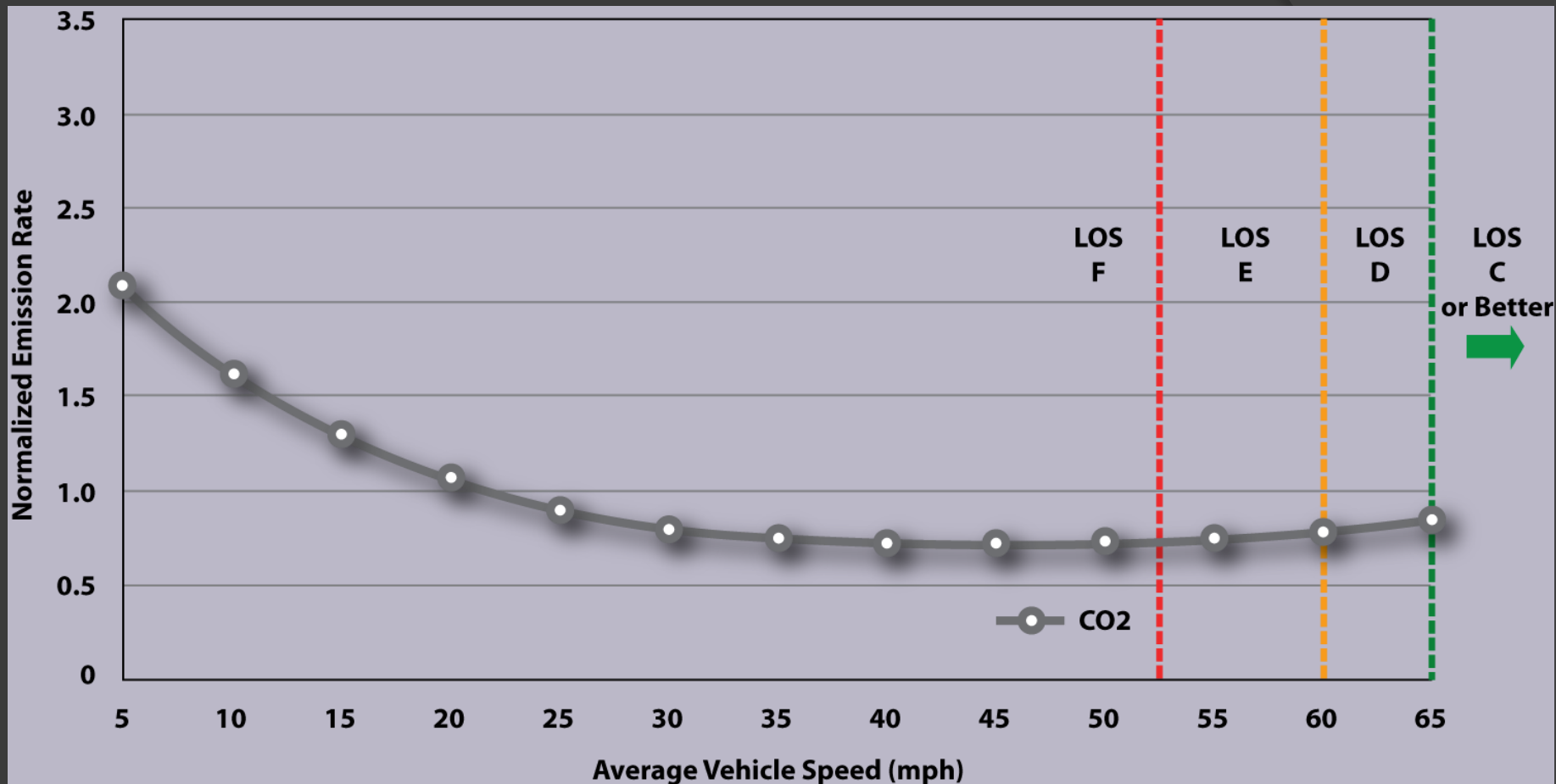
ID <sup>1</sup>	VMT Gap Reduction Measure	Effectiveness (VMT Reduction)	Reduction Confidence <sup>2</sup>	Grouped Measure <sup>3</sup>	PCA <sup>4</sup>	Description
<i>Community Enhancement</i>						
SDT-1	Pedestrian Network Improvements	0.00 - 2.00 %	Tier 1	SDT-1	Yes	Comprehensive pedestrian network consisting of paths, sidewalks, and roadway crossing treatments; Well-connected internal network linking land use and free of barriers; Connections to pedestrian facilities external to the site
TRT-9	Car Sharing	0.40 - 0.70 %	Tier 1	TRT-1 and 2	Yes	On-demand access to a fleet of shared-vehicles; User fees are typically collected through an annual membership, mileage and hourly rates
SDT-2	Traffic Calming Measures	0.25 - 1.00 %	Tier 2	No	Yes	Roadway environments designed to promote reduced speeds and encourage pedestrian and bicycle trips; Project may include curb extensions, speed humps or tables, raised intersections, median islands, traffic circles and tight corner radii
SDT-3	Neighborhood Electric Vehicle Network	0.50 - 12.70 %	Tier 2	SDT-8	Yes	Comprehensive neighborhood electric vehicle network provided through a combination of roadways with a maximum posted speed limit of 35mph and designated off-street paths
SDT-6	Bike Parking in Non-Residential Projects	0.63%	Tier 2	LUT-9	Yes	Short-term and long-term bicycle parking; Project may include a combination of bike racks, bike lockers, or secure, bike stations
SDT-4	Urban Non-Motorized Zones	NA	Tier 3	SDT-1	No	Car-free areas typically located in business districts or major activity centers; Project may replace roadway environments with transit malls, linear parks or similar facilities
SDT-5	Bike Lane Street Design (On-Site)	NA	Tier 3	LUT-9	Indirectly	Comprehensive bicycle network consisting of bicycle lanes, routes and shared-use paths; Well-connected internal network linking land use and transit facilities; Connections to bicycle facilities external to the site
SDT-7	Bike Parking in Multi-Unit Residential Projects	NA	Tier 3	LUT-9	Yes	Short-term and long-term bicycle parking; Project may include a combination of bike racks, bike lockers, or secure, bike stations
SDT-8	Electric Vehicle Parking	NA	Tier 3	SDT-3	Yes	Provision of accessible electric vehicle parking

# Applying the Threshold

YEAR 2035 PROJECTED WEEKDAY VMT GENERATED PER HOUSEHOLD (1)	
Dunnigan Specific Plan (DSP)	49
Dunnigan–Knights Landing (without DSP)	84
Woodland	44
Davis	44
Winters	52
North Natomas	49
Elk Grove	57

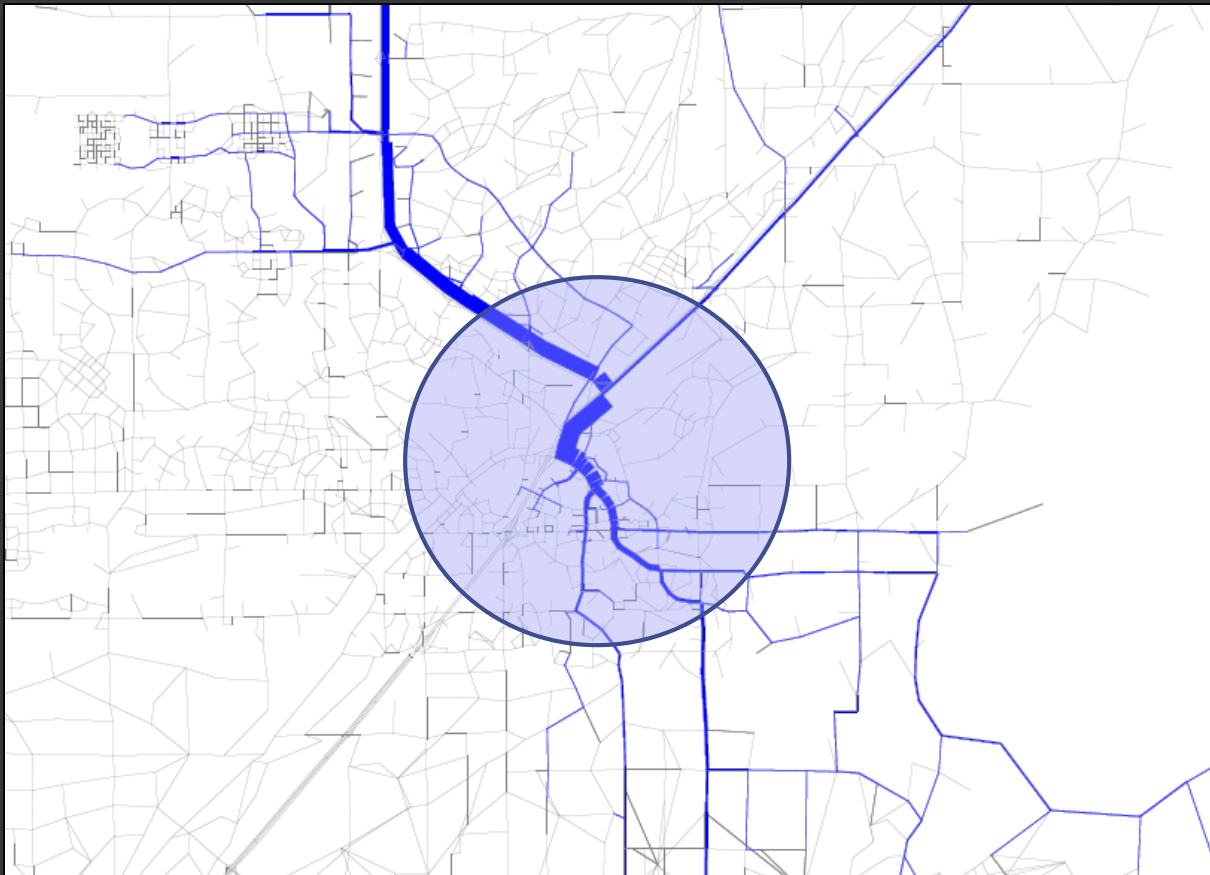


# What About Infrastructure Projects?



## With VMT, Speed Matters....

Relationship of Freeway LOS, Speed, and CO2 Emissions Factors



## VMT vs Fuel Consumption

Need to determine the **Study Area**, the **Methodology**, and the **Threshold**

## Project Information

Project Name

new

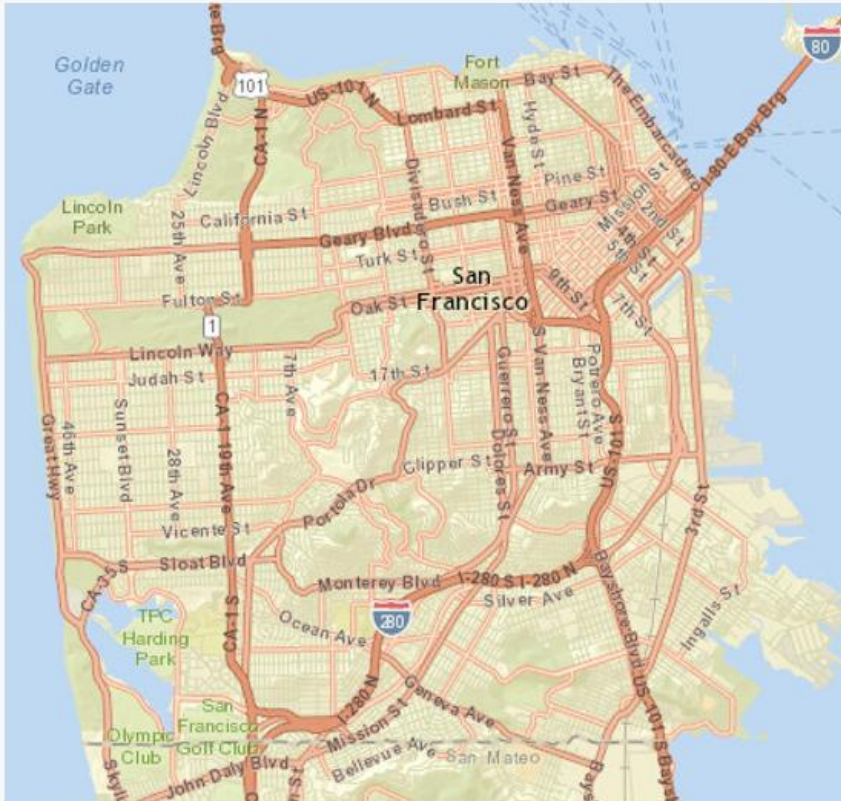
test3 additional name

Project ID

43

SF CHAMP TAZ

254



Project Info

TDM Strategies

Summary

Report



**SFMTA**  
Municipal  
Transportation  
Agency

Project Type

Urban High

Residential

100 Dwelling Units

Office

354 ksf

Retail

2 ksf

Institutional

ksf

Event Venue

ksf

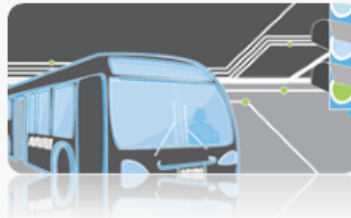
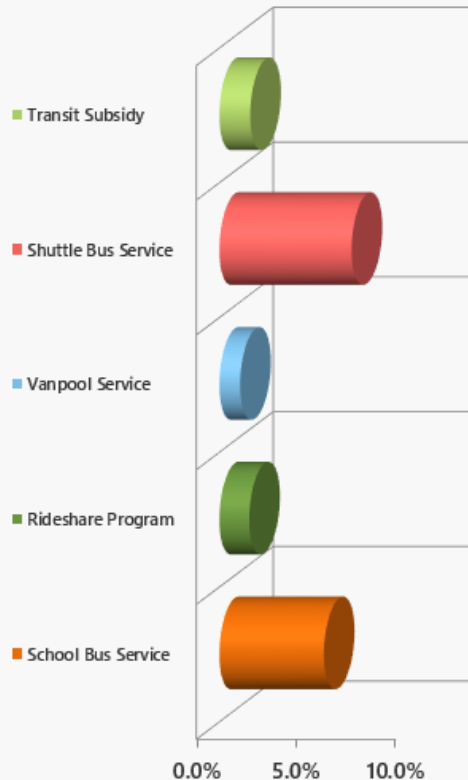
Hotel

78 Rooms



# Transit and HOV Incentives

Office Reduction = 15.1%



Office

Transit Subsidy

100

percentage of employees eligible

%applicable

100

0.75

amount of transit subsidy per passenger (daily equivalent)

Shuttle Bus Service

87

percentage of employees eligible

%applicable

100

medium

degree of implementation

medium

employer size

Vanpool Service

10

percentage of employees eligible

%applicable

100

medium

degree of implementation

large

employer size

Rideshare Program

50

percentage of employees eligible

%applicable

100

School Bus Service

7

percent of families expected to use school bus program

%applicable

100

Project Info

Transit & HOV

Active Transportation

Parking

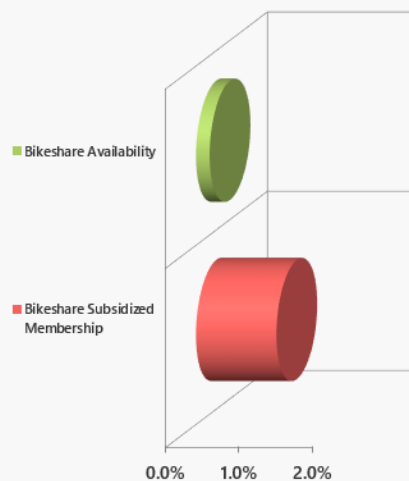
Programs

Summary

Report

## Active Transportation

Office Reduction = 1.3%



Office



Bikeshare Availability	<input type="checkbox"/> Yes	Is there a bikeshare station within 1 block of project site	%applicable
			<input type="text" value="100"/>

Bikeshare Subsidized Membership	<input type="text" value="100"/>	Percent eligible	%applicable
			<input type="text" value="100"/>

Project Info

Transit & HOV

Active Transportation

Parking

Programs

Summary

Report

## Parking

Office Reduction = 55.8%



Office

<b>Parking Supply</b>	<input type="text" value="0"/>	Total number of general parking spaces	<input type="text" value="100"/>	%applicable
<b>Carshare Parking</b>	<input type="text" value="0"/>	Total number of carshare parking spaces ON street	<input type="text" value="100"/>	%applicable
	<input type="text" value="0"/>	Total number of carshare parking spaces OFF street		
<b>Subsidized Carshare Membership</b>	<input type="text" value="3"/>	Years of membership	<input type="text" value="100"/>	%applicable
<b>Unbundled Parking Cost</b>	<input type="text" value="200"/>	Unbundled monthly parking cost from lease or sale (\$/month)	<input type="text" value="100"/>	%applicable
<b>Priced Parking</b>	<input type="text" value="10"/>	Daily parking price (\$/day)	<input type="text" value="100"/>	%applicable
	<input type="text" value="15"/>	Percent of employees subject to above priced parking		
<b>Parking Cash-out</b>	<input type="text" value="85"/>	Percent eligible for parking cash-out	<input type="text" value="100"/>	%applicable

Project Info

Transit & HOV

Active Transportation

**Parking**

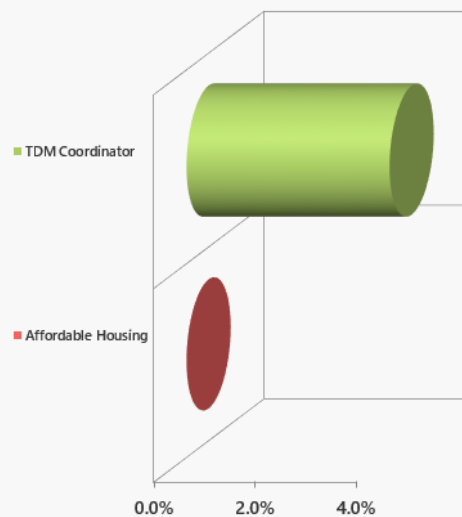
Programs

Summary

Report

## Other Programs

Office Reduction = 4.0%



Office

TDM Coordinator	Yes	On-Site TDM Coordinator providing Transportation Brokerage Services	%applicable
	100	Percent of eligible employees	100

Affordable Housing	20	Percent of On-Site Affordable Housing units	%applicable
			0

Project Info

Transit & HOV

Active Transportation

Parking

Programs

Summary

Report

## Global Reduction Summary

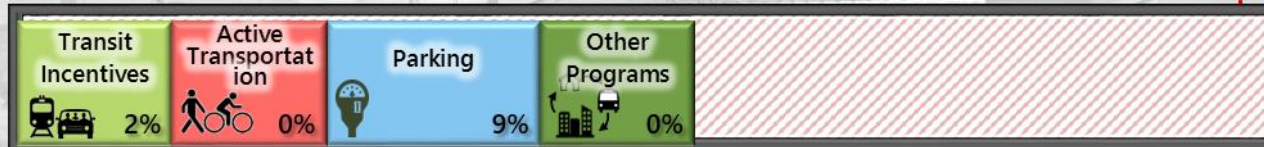
Project Name

test3 additional name



**SFMTA**  
Municipal  
Transportation  
Agency

Policy Goal = 35%



Total Reduction = 11%

Project Info

TDM Strategies

Summary

Report

# 17

## Future-Shaping Phenomena



# TRENDLAB<sup>+</sup>

## US Vehicle Miles Traveled per Capita per Year in 2040 and 2060



VMT per capita will be 10% to 20% below its 2004 peak, suggesting benefits may be derived through rebalancing transportation investment among auto and alternative travel modes, and producing reductions per capita in energy use and emissions.

### Your Forecast

2040	2060*
11,550	15,100

\* Fehr & Peers 2060 forecast range: 10,000-18,000

### 2040 Published Forecasts

- 17,100 VMT per capita  
U.S. DOT
- 16,300 VMT per capita  
Transportation Financing Commission
- 13,400 VMT per capita  
U.S. Energy Administration
- 12,200 VMT per capita  
Public Interest Research Group: High
- 8,200 VMT per capita  
Public Interest Research Group: Low



# VMT Co-Benefits

## Environment

- Emissions
  - GHG
  - Regional pollutants
- Energy use
  - Transportation energy
  - Building energy
- Water
  - Water use
  - Runoff – flooding
  - Runoff – pollution
- Consumption of open space
  - Sensitive habitat
  - Agricultural land

## Health

- Collisions
- Physical activity
- Emissions
  - GHGs
  - Regional pollutants
- Mental health

## Cost

- Increased costs to state and local government
  - Roads
  - Other infrastructure
  - Schools
  - Services
- Increased private transportation cost
- Increased building costs (due to parking costs)
- Reduced productivity per acre due to parking
- Housing supply/demand mismatch → future blight